

Official Journal of the National Brotherhood Electrical Workers of America.

VOL. 6. No. 6.

ST. LOUIS, JUNE, 1897.

SINGLE COPIES, 10 CENTS.
\$1.00 PER YEAR, IN ADVANCE.

CALCULATION OF WIRING.

Owing to the many requests being received concerning the calculation of electrical conductors—particularly for transmission lines—this article will be devoted to that subject.

The rational American wire gauge is based upon the circular mil, which is a cross-section corresponding to a diameter of one-thousandth of an inch. An advantage of this system is that by it one is enabled to determine very simply the cross-section of a wire if the diameter is known, or its diameter, if the cross-section is known. For example, if the diameter is one-tenth of an inch or 100 mils (about No. 10 B. & S.), the circular mils are found by squaring this quantity, which gives 10,000 circular mils; or, if the section is .26, 250 circular mils (No. 6 B. & S.), the diameter is found by extracting the square root of this quantity, which gives 162 mils, or .162 in.

The selection of the mil as the unit seems to have been unfortunate, owing to its smallness, which may be appreciated from the statement that paper on which this is printed is about 3 mils thick. The smallest wire known to commerce—No. 40 B. & S.—is almost 10 mils in diameter. If the one-hundredth of an inch had instead been used, the numbers would be much more convenient. In this case the cross-section of a No. 30 wire would be 1 circular unit, that of a No. 10 wire 103.8 circular units, and of a No. 40 wire 2116 circular units, while a cable of 5,000,000 circular mils would become 50,000 circular units. It would, perhaps, have been difficult to have found a name for the unit as suitable in length and sound as the corresponding one of "mil," but this would have been a small matter.

The Brown & Sharp wire gauge is based upon the logarithmic curve, but is practically an arbitrary system. It has, however, one valuable property, which is that the cross-section is almost exactly doubled every third number. That is, the cross-section of a No. 2 wire is double that of a No. 5 wire, and therefore its resistance is half that of the latter; or the cross-section is one-half that of a No. 20 wire and its resistance, therefore, twice greater. It happens

that the diameter of a No. 10 wire is almost exactly 1-10 in. or 100 mils, and its resistance about one ohm per 1,000 feet. By bearing these easily remembered numbers in mind the cross-section and resistance of other wires on the B. & S. scale at intervals of three numbers on either side may almost instantly be known. Assuming the cross-section to be 10,000 circular mils 100 (mils) X 100 (mils), the cross-section of a No. 7 wire is 20,000 mils, of a No. 4 wire 40,000 mils, of a No. 1 wire 80,000 mils, of a No. 3-0 wire 160,000 mils, etc.; the resistances per 1,000 ft. being $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ and 1-16 ohm, respectively. Similarly, the cross-sections of No. 13, 16, 19 and 22 wire are 5,000, 2,500, 1,250 and 625 circular mils, respectively; and 2, 4, 8 and 16 ohms, respectively. The above figures are not exact, the cross-section of a No. 3-0 wire being, for example, 167,800 instead of 160,000 mils, but they are sufficiently close for the purposes for which such a short-cut method would be used.

The formulas for calculating the sizes of conductors are most simply built up if the basis is made the resistance of a mil-foot of wire; that is, the resistance of an assumed wire one foot long, having a diameter of one mil and consequently a cross section of one circular mil.

In order to deduce this value we must know the specific resistance or resistivity of conductors. This is given for all the various conductive materials in tables that may be found in text-books and elsewhere. After having made the necessary corrections to the quantity found in such a table for temperature and percentage purity, we have for the value of copper about 1760, which is the resistance of a piece of copper one centimetre long, having a cross-section of one square centimetre.

By referring to a table of metric equivalents, it will be found that a square centimetre contains 197,400 circular mils; therefore, the resistance of a wire one centimetre long, but having a cross-section of one circular mil will be $197,400 \times 1760$ units. Also, since a foot contains 30.48 centimetres, if the length were a foot instead of a centimetre, the resistance would again be increased, and now become $197,400 \times 1760 \times 30.48$. But an ohm contains 100,000,000 absolute

units of resistance, so to reduce to ohms the above product must be divided by this quantity. Performing the multiplication and division, we have, finally, 10.6 ohms to be the resistance of one foot of wire of one circular mil cross-section.

By carrying this useful constant in the memory, and remembering the data given above for a No. 10 wire, one can be independent of wire tables and formulas for approximate calculations.

For example, suppose it is required to know the size of wire to carry 50 amperes 200 feet with a drop of 5 per cent, the voltage being 125. The drop will thus be $.05 \times 125 = 6.25$ volts, and from

Ohm's law $R = \frac{E}{C}$, we find the resistance to be $6.25 \div 50 = .125$ ohm. As the distance is 200 feet, 400 feet of wire will be required. The resistance of 400 mil-feet of wire is $10.6 \times 400 = 4240$ ohms; as the actual resistance of the line in question is, however, only .125 ohm, the size of the wire that will have this resistance will be in the proportion of $4240 : .125$; the quotient of the former by the latter is 33,920, or the required cross-section of wire is 33,920 circular mils. Now, as shown before, the cross-section of No. 10 wire being 10,000 circular mils, that of No. 7 is 20,000 circular mils, and of No. 4 40,000 circular mils. Dividing the difference between No. 4 and No. 7 wire, or 20,000, into three parts, we have 27,000 and 34,000 as rough approximations to the cross-sections of No. 5 and No. 6 wire, and it is at once seen that No. 6 is the nearest gauge number to the required size of wire.

The above operation may be expressed in the following rule:

1°. From Ohm's law, $R = \frac{E}{C}$, where E

is the drop in volts, and C the current to be carried, find the resistance, R, of the circuit. 2°. Multiply the length of conductor in circuit in feet by 10.6. 3°. Divide 1° by 2°, which gives the circular mils of cross-section in required conductor.

The above rule is very simply expressed in the formula,

$$\text{circ. mils} = \frac{21.2 L C}{p E}, \quad (1)$$

where L is the length of line, C the current, E the voltage, and p the percentage drop. The formula may be put in the more satisfactory form

$$\text{circ. mils} = \frac{2120 L C}{p V} \quad (2)$$

where V is the line voltage and p is expressed as an integer instead of a decimal—as 5, for example, instead of .05, when the drop is 5 per cent. Applying the data of the problem solved approximately above, we have

$$\text{circ. mils} = \frac{2120 \times 200 \times 50}{5 \times 125} = 33,920.$$

Suppose we wish a formula for wiring incandescent lamps, in which the number of lamps and not the current enters. In this case we will represent the number of watts to each lamp by W, and if the number of lamps is N, the total watts are N×W. Since the watts are also the product of the E. M. F. by the current

(CE), the current is $\frac{N W}{E}$; substituting this in formula (2) for C, we have

$$\text{circ. mils} = \frac{2120 W L N}{p E^2} \quad (3)$$

If lamps are distributed along the circuit to be calculated, the distance, L, will be the distance to the center of all the lights and not the total length of the line. As an example, suppose there are 50 lamps of 3½ watts per CP or 56 watts per lamp, the voltage being 110, the drop 3 per cent, and the distance to center of lights 100 feet. We thus have

$$\text{circ. mils} = \frac{2120 \times 56 \times 100 \times 50}{3 \times 110 \times 110} = 16,352,$$

which is equivalent to No. 8 B. & S. wire. By means of formula (2) the usual tables for lamp wiring may be computed.

In interior wiring, it is always necessary to see that the size of wire calculated is large enough for underwriters' requirements with respect to heating, or, as it is sometimes called, carrying capacity. Since the watts per lamp in this case are 56 and the voltage 110, the current for each lamp is $56 \div 110 = 509$ amperes, or 25.4 amperes for 50 lamps. As the underwriters' rules allow (or did allow) 25 amperes for No. 8 wire, the size calculated for drop will just pass muster. For lines of considerable length the heating limit cuts no figure, owing to the more considerable section it is necessary to provide the conductor for a given current in order to keep down the drop.

The above formulas are all that are necessary for any wiring calculations based upon considerations of simple drop alone, applying equally to direct currents and to alternating currents, both single and polyphased. With polyphased currents, however, allowance must be made for the increased copper economy entailed by their use, which amounts to 25 per cent. in the three-phased system. This may most simply be done by using formula (1), and then for each wire in the three-phased system (which system probably always alone apply to transmission lines), take half the size of the wire calculated by that formula. The reason for this may be illustrated as follows:

Suppose from formula (1) we find the cross section with the given data to be 100,000 circular mils, on the basis of a two-wire, continuous-current system; the cross-sections of both conductors will thus be 200,000 circular mils. Since, however, the three-phased system only takes three-fourths as much copper as

the continuous-current system, this cross-section is reduced to 150,000 circular mils, and there being three wires, each will have a cross-section of 50,000 circular mils, or half that of each of the two conductors in the continuous current system.

Having found the section in this manner of the conductors of a three-wire system, allowance must next be made for idle current due to the inductance of the motor load. Suppose the load factor to be .95, which means that of the entire current passing over the line only .95 is effective. In order to keep the drop the same, the cross-section will have to be increased in the proportion of 1:.95; or, dividing 50,000 by .95, we have 52,632 circular mils. The factor .95 might instead have been introduced in the formula by increasing the amperes in the ratio of 1:.95, which is the usual method.

The caution should here be given that the calculation of long lines for the transmission of considerable quantities of electrical energy is not made in the simple way here indicated, for reasons given in another column. Nor does the method take into consideration drop due to inductance, which is a quantity depending, as shown in previous articles, upon the amount of current carried and the distance apart and relative disposition of the line wires; this drop may, however, be practically counterbalanced by the use of over-excited motors at the receiving end of the line. The method, nevertheless, may be made to answer for rough preliminary estimates of copper required, and will be here applied to answer the query of a correspondent, who asks the cost of copper to transmit 1000 HP 30 miles. The calculation is made for the three-phased system and a drop of 10 per cent, a load factor of .95 and at a cost of 12 cents per pound for copper, the voltage being assumed 10,000.

As the drop is 10 per cent and the voltage of delivery is 10,000, the original voltage must be in the proportion of 1:1.1, or 11,111 volts, or the drop is $11,111 - 10,000 = 1111$ volts. In 1000 HP there are 746×1000 watts (CE); the current is therefore $746,000 \div 10,000 = 74.6$ amperes, which being increased in the proportion of 1:.95 by the load factor, becomes 78.6 amperes.

The length in feet of 30 miles is 158,400, and substituting in formula (1), $C = 78.6$, $L = 158,400$ and $p = 1111$, we have for the size of each of two conductors

$$\frac{21.2 \times 78.6 \times 158,400}{1111} = 237,400 \text{ circ. mils.}$$

The cross-section of each conductor in the three-wire system, being one-half of this, is 118,700 circular mils, or somewhat larger than No 0 wire. The weight per foot of 4-0 bare copper wire is .64 lbs., and as the cross-section of 4-0 wire is 211,600 circular mils, the calculated $\frac{118,700 \times 475,200}{211,600} \times .64 = 200,100$ lbs.

At 12 cents per pound, the cost of this will be \$24,012. Supposing that there are 50 poles to the mile, costing set, \$6 each, including insulators and cost of stringing wires, the total cost of pole line becomes about \$31,000, or \$31 per horse power. As the water power development and cost of generating plant and transformers might easily amount to much over \$100,000, it will be seen that usually it is not necessary to go into the cost of the copper to determine the feasibility of a transmission scheme.—American Electrician.

THE USE OF NIAGARA FALLS POWER.

Interesting Facts About a Great and Growing Power District.

Although the Niagara Falls Power Company's station, at Niagara Falls, N. Y., has been in operation less than 20 months, it is probably unequaled by any other power station in the world in the variety of methods by which its power is being used to-day. Nor is this variety of methods more wonderful than the number and nature of the changes made with the electric energy to prepare it for the various uses to which it is applied.

At the main bus bars of the central station is supplied an alternating, two-phase current of 25 cycles, the pressure being kept at 2,200 volts. If we commence at the feeder switches, giving preference to that one whose meters are registering the greatest amount of power, we find that it is supplying the Pittsburgh Reduction Company.

At the works of this company is a transformer room belonging to the power company, in which are installed five 600-horse power rotary transformers, supplied with alternating current at 130 volts from a double row of 10 static transformers, and furnishing nearly 15,000 amperes of direct current at a pressure of about 165 volts. This block of power is used to obtain aluminum, by electrolysis, from its oxide—alumina.

On the same set of feeder cables as the Pittsburgh Reduction Company is the Niagara Electro-Chemical Company, who use their block of 400-horse power in much the same manner as the first-named company, the voltage being reduced and the current then changed to direct current at a pressure of 150 volts. This company is making metallic sodium from the hydrate of sodium, just as the Pittsburgh Reduction Company makes aluminum from the oxide of aluminum.

Besides the power furnished to these two companies, there is a small block of about 50-horse power furnished to the Acetylene Light, Heat and Power Company, or, as it is more familiarly termed, the Carbide Works. This power is used, by means of a 2,200-volt two-phase induction motor, to drive the crushing, grinding, sifting and carrying machinery.

Taking the next feeder switch at the central station, we find that it is supplying the Carbide Works and the Carborundum Company. These companies use single-phase current and are run from opposite phases of the system in order to balance the station load. Each uses 1,000 horse-power at present, and applies it in the form of heat, their product being formed by chemical action, which takes place only at very high temperatures. Heat being the only requirement, a direct current is not necessary, but the voltage is lowered by transformers to from 100 to 150 volts. Here the resemblance between the two ceases. The Acetylene company uses an arc furnace to make calcic carbide from lime and coke. The Carborundum Company uses an incandescent furnace to make carborundum from sand and coke. In both cases the furnaces are the largest in existence.

Next in order among the feeder switches at the main station is the one supplying the Cataract Power and Conduit Company, or, as it is better known, the Buffalo transmission line. So much

has been written about the transmission line lately that little need be mentioned. The pressure being raised from 2,200 to 11,000 volts, and the system changed from two-phase to three-phase by the transformers at the Falls end of the line, the power is carried 27 miles to the Buffalo Street Railway Company's power house. There it is transformed down to 370 volts and changed to 550 volts, direct current, by means of rotaries. One thousand horse-power is being supplied at present, and, as it is used by the street railway system, we see that mechanical energy is the final form in which it is applied.

Coming finally to the fourth feeder switch, we find it supplying quite a number of consumers. One block of 500 horse-power is taken by the Buffalo & Niagara Falls Electric Light and Power Company, who have substituted two 300 horse-power, 2,200 volt, two-phase induction motors for their steam plant. This power is, of course, distributed in all of the different forms usually found in a city lighting plant, and is used in arc and incandescent lamps and in small motors.

The rest of the power is supplied by the fourth feeder switch, except the small amount used for heating the station and for lighting the wheel-pit. It is transformed to 575 volts, direct current, by static and rotary transformers placed in a corner of the power station.

The principal consumers of this power are the Buffalo & Niagara Falls Electric Railway Company and the Niagara Falls & Suspension Bridge Railway Company, the former using 300 horse-power on their trolley line from Tonawanda to the Falls, and the latter using 250 horse-power on the local system.

But there are also a number of small blocks of power distributed from this board, which are put to a great variety of uses, and help to enforce the truth of the statement made at the commencement of this article. Among the consumers are a machine and foundry company, a lumber yard, artificial ice works and the local waterworks.

There is one more outlet for the power generated at the central station, namely, the small rotary transformers, which supply current for exciting the dynamo fields. This current is also put to all manner of uses about the station—running the 50-ton crane, the wheel-pit elevator, arc and incandescent lamps in various places, water-gate motors, grindstones, turning lathes, and even being sometimes used to explode the dynamite when blasting in the wheel-pit extension.

Within a year several new factories will be located on the power company's land, taking blocks of power of from 300 to 3,000 horse-power, which will be used principally in electrolytic and chemical processes. The buildings of two of these companies—the Mathieson-Alkali Company and the Albright-Wilson Company—are about finished, and the machinery will be installed within a very few weeks. The first-named of these will use 2,000 horse-power and manufacture soda ash and bleaching powder of electrolysis. The other company will take 200 horse-power. It is difficult to foresee what the condition of affairs will be five years from now. Not only are new companies locating rapidly, but those already here are contemplating large extensions. The Acetylene Light, Heat and Power Company are nearly ready to use 5,000 horse-

power, which will be used in their large addition to the original building.

The new building contains 25 furnaces and when these are in operation the four that are now in use in the old building will be torn down and the space used for other purposes. The Carborundum Company will double the number of their furnaces shortly, which will also call for another block of 1,000 horse-power.

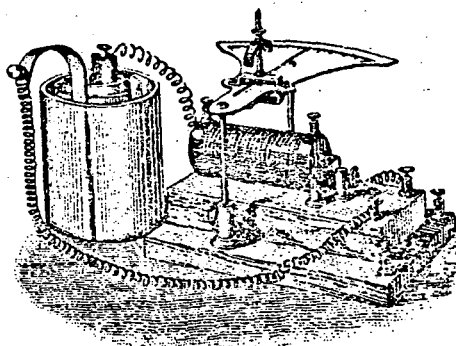
Altogether it is safe to prophesy that the Niagara Falls Power Company will soon be taxed to its utmost capacity in order to make the supply of power equal the demand.—Electrical Review.

AN INDUCTION COIL FOR ELECTRICAL MEASUREMENTS.

It is easy to transform induction coils of the ordinary form into delicate measuring instruments, says Albert Nodon, and then he proceeds to explain the proposed arrangement and use as follows:

If we place above an induction coil a magnetic needle, free to move in a horizontal plane, as shown in the cut, and then send a current of electricity through the coarse coil of the instrument after the needle has had time to settle, we will see that the needle will be deflected, and have a tendency to place itself parallel to the axis of the coils. Again, if a current is sent through the fine or secondary wire, we will also see a deflection. These movements of the needle may be controlled as to their amplitude by means of a dampening magnet placed over the needle. We thus create a magnetic field of variable intensity.

We now see that we can utilize the induction coil as either a voltmeter or an ammeter, for the former of these is but a fine-wire galvanometer, and the second



a coarse-wire galvanometer, and by the use of both wires we will have a wattmeter.

The arrangement of the parts is readily seen. A base of wood supports two sliding rods, adjustable for perpendicular height. These rods form the supports for the needle, which can be adjusted for distance from the coils. A scale is shown upon which an indicating needle of aluminum traverses, this last being part of and attached to the magnetic needle, which is balanced on points, and has its length parallel to the indicating needle. The directing magnet is capable of being raised and lowered at will.

We can, with this instrument, test currents up to about 40 amperes by using the two uprights as terminals. The direction of the deviation of the needle also shows the direction of the current flow.

For intensities between five amperes and about 1-100 of one ampere, send the current through the heavy wire of the coil. Then adjust the frame by sliding

the supports up or down, and vary the distance of the director magnet.

For feeble currents, down to milliamperes, send the current through the fine wire. Adjust as before, but in a contrary sense.

For use as an amperemeter there is within the base a German silver resistance measuring two ohms, which assists in the graduation. To accomplish this we use an ordinary lead accumulator cell of two volts, and of which the interior resistance is negligible. We pass the current at the same time through the resistance of two ohms and the large wire, the resistance of which is also negligible, and obtain, according to Ohm's law:

$$C = \frac{E}{R} \quad \text{or} \quad C = \frac{2 \text{ volts}}{2 \text{ ohms}} = 1 \text{ ampere.}$$

Then, for the intensity of one ampere (C), the needle stops at n, divisions of the graduated scale. Now, as in a tangent galvanometer, the deviations of the needle are proportioned, approximately, to the current flow; the standard being the ascertained deflection for one ampere, as we have just seen, it is easy to figure out the flow for a given deflection. The range of the instrument and the small compass make it extremely convenient as well as useful.

With a standard, either an accumulator or a Daniell cell, we may by using the fine wire get the known deflection of two volts or one volt of pressure by a similar process of proportion. In practice the accumulator cell is better, for the reasons that it can be used for both volt and ampere measurements, and also for actuating the coil as an induction instrument.

In connecting up the terminals so that the current is sent through both the large and small coils at the same time, after the interposition of the two ohms, we have

AN INDUCTION COIL FOR ELECTRICAL MEASUREMENTS.

Again, a proportional deflection of the needle, which indicates the watt energy. $W = \text{amperes into the volts, or } W = 1 \text{ A} \times 2 \text{ V} = 2 \text{ watts.}$

We see, then, that by the aid of this simple instrument we may effectually accomplish all the necessary measurements for ordinary electrical purposes where great accuracy is not required.

The amateur, who is often restricted financially as well as in the variety and quantity of apparatus, can in this single piece avail himself of its several purposes at a limited expense, for he will have at one and the same time for a minimum cost: First, a current indicator; second, a coarse-wire galvanometer; third, a fine-wire galvanometer; fourth, an amperemeter ranging in capacity from 1-100 to 50 amperes; fifth, a voltmeter ranging from 500 volts to 1-100 volt; and sixth, a wattmeter.

CHEAP LIGHT FOR DES MOINES, IA.

The Board of Public Works of Des Moines, Ia., after a thorough consideration of the several bids on a municipal lighting plant last week, through its electric light committee, concluded to recommend to the Council the proposal of the McCaskey & Holcomb Company of Springfield, Ill., on a combined tower and low-light system. The company's bid is considered by some phenomenal, as under its terms the city becomes the owner

of the plant in about six years, by paying at the rate of \$4,583.33 1-3 per month. The company submitted bids for a 350-light tower system and for a 500-light, low-light system, the figure on the tower system being \$123,360, while the low-light system will cost \$113,360. The bid of the McCaskey & Holcomb Company was the only one covering a complete plant, and thereby conforming to the terms of the advertisement. The city of Des Moines is paying at present for about 300 lights, at the rate of \$96 for the moonlight schedule, and \$126 for the all-night lights.

ELECTRIC TRACTION FOR SUBURBAN RAILROADS.

When the trolley cars begin running on the Batavia or Oak Park branch of the Chicago and Northern Pacific, electricity will have scored its first point in Chicago in the contest between steam and electricity as motive power on suburban lines. This rivalry, says the "Chicago Record," is regarded as a matter of great importance with railroad men to-day. The successful third-rail experiments of the New England road within the last two weeks have given electricity a long lead, and when the directors of the Illinois Central give the word to Chief Engineer John Wallace to go ahead and equip the suburban lines between Randolph and Sixty-third streets with the third-rail system, the "juice," as railroad engineers call electricity, will be a winner. This is the opinion reluctantly expressed recently by the superintendents of motive power on half a dozen strong roads.

From all parts of the country come reports of the war which the electric motor is waging with the steam locomotive on suburban lines. In some instances the railroads have given in, and have adopted the "broom-stick" engines. The New York Central is preparing to equip one of its suburban divisions with electric service. The conservative Lake Shore and Michigan Southern is in the heat of a fight with electric lines, which have stolen away considerable of its Cleveland suburban business.

This is a war of rates, but it is predicted that in a short time the Lake Shore either will adopt street-car methods with its steam service or else install the "juice." A hot fight is on in Detroit between steam and electric roads for suburban traffic, and the electric lines are ahead. The steam roads put on more cars and more trains, but they are handicapped because their stations are too far apart and because trains are run by timetable.

In Chicago the electric lines reaching out into the suburbs and paralleling the steam railroads, have cut into the suburban business to such an extent that on some of the roads this business is given up. In the East, where cities and towns are close together, the electric railway lines have seriously affected the profits of steam railroads, which are gradually losing control of the short-distance suburban and interurban business.

Eastern railway men frankly admit that electricity will soon take the place of steam on many roads in Massachusetts, New York, Rhode Island, New Jersey, Connecticut and Pennsylvania. They say that the solution of the problem which confronts steam railroads in the retention of their local business lies in the

adoption of electricity and the multiplication of stations. Some roads will adopt radical measures and change their steam equipment to electrical equipment. Other roads will parallel their lines with electric lines.

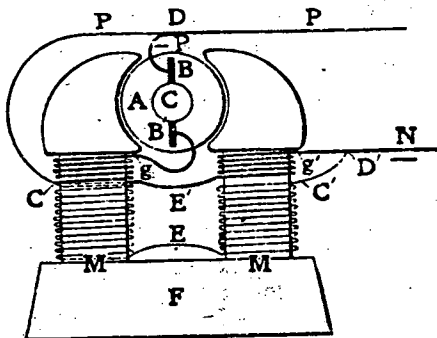
In Chicago the large roads having heavy suburban business are waiting to see what the Illinois Central will do. The elevation of railroad tracks will abolish grade crossings, and this one improvement will put most of the roads in a condition to equip their suburban lines with the third-rail system.

THE ACTION OF THE DIFFERENTIALLY-WOUND MOTOR.

By Wm. Baxter, Jr.

Before the action of the shunt-wound motor and its capability of maintaining a practically uniform speed under variations of load were fully understood, the differentially-wound motor was devised. It is not now much used; but a study of it is instructive, especially because of its relationship to the compound-wound dynamo, which is of great importance.

This method of winding is shown in the figure. It is a combination of the series and shunt windings shown in previous articles. As will be seen from the figure, the current shunted through P1 from P at D passes through a portion of the wire on the field, and joins N at D1 the same as in the shunt-wound ma-



chine. It will also be seen that the main current, after passing through the armature, enters the field coils through g and comes out at g1, where it joins N. The two sets of field coils are kept separate from each other throughout their entire length. The current through the coils in series with the armature passes around the field magnets, in the opposite direction to that taken by the current in the shunt coils.

The action of a motor so wound is as follows: If the load is increased, its tendency is to reduce the speed, and hence the counter electromotive force, the latter being proportional to the speed. But the reduced counter electromotive force allows more current to flow through the armature, and hence through the series field coils. This increased current in the series coils counteracts a greater amount of the current flowing through the shunt coils than before, and as a result the strength of the field magnets is reduced.

A reduction in the strength of the field magnets is accomplished with an increase of speed. The effect of an increase of current in the series of coil being to weaken the field magnets, the tendency from this cause is to increase the speed; therefore, the first momentary check of the speed, when the load

is increased, is largely counteracted by the fact that the field strength is reduced, hence the counter electromotive force per turn becomes less and therefore the speed must immediately increase. This increase may not be enough to restore the original velocity, but it will make the difference less than it would be with a simple shunt wound field. The cutting-down of the strength of the field magnets is not, however, as great as would at first sight appear, as the increase of speed develops an increased counter electromotive force which checks the increase of current. From this it might be concluded that the benefit that can be derived from this arrangement is not very great; but if we reflect on the subject, we will see that if the load is reduced one-half, the current through the armature, and therefore the series coils, will be reduced one-half. If the load is reduced to one-tenth, the current will be correspondingly reduced; therefore, the demagnetizing action of the series coils will be nearly proportional to the changes in load.

We thus have two influences working in opposite directions—the direct tendency of the increased load is to reduce the speed, but the tendency of the reduced field strength is to increase it. Which will prevail, will depend upon the arrangement of the series field coils. If these coils are made of a very few turns, say two or three, their effect will be very slight; but if the number of turns is great, the effect may be sufficient to entirely neutralize the shunt coils, or even reverse the magnetism of the field. From this it follows at first sight that, by properly adjusting the number of turns in the series coils, we can maintain the speed constant under all variations in load; and if we desire to have the speed increase as the load increases, we can accomplish the result by adding more turns to the series coils. As these statements might create a false impression as they stand, it may be well to say that in practice perfectly uniform velocity cannot be obtained, because under such conditions the motor would be in a state of such delicate balance that the slightest variation in load would disturb the velocity, consequently the speed would oscillate continually. To avoid this, it is necessary to so adjust the series coils that the velocity may drop slightly with an increase of load. A motor wound to increase its speed with increase of load would also be impracticable. It could not be started except in the reverse direction unless the series coil were not thrown into service until full headway was attained, and the throwing in of the series coil would be very likely to cut down the field strength so much that the reaction of the armature would neutralize it. This would cause the motor to stop and then start in the reverse direction. But while all this was going on, the sparking at the commutator brushes would be so great as to probably burn out the armature.

In shunt and differentially-wound machines the shunt coils are made of very fine wire, as compared with that used in the armature and series coils, and of a great many turns and high resistance. This is necessary so as to allow a small percentage only of the total current to pass through the field. If the energy used to magnetize the field is to be, say, three per cent. of the whole current, the resistance of the shunt coils must be so

high as to allow only three per cent. of the current to pass through them.

In considering the action of a differentially-wound motor, we have found that when the load increases the strength of field decreases. This fact has proved a great mystery to many men, and lengthy articles have been written to explain it, some resorting to the higher mathematics to throw light upon the subject; but notwithstanding all this apparent mystery, the action is very simple when properly understood. All that we need to do is to remember that the torque of a motor is the product of the strength of the field by the strength of the current in the armature. Keeping this fact in mind, we can easily see that if the field strength is reduced one-half, the torque can be kept at the same point by doubling the armature current, and if the current were quadrupled the torque would be doubled.

Series-wound motors, as was shown in an article describing their action, which appeared in the issue of January, are not suitable for running general machinery, but for all classes of work where variable speed is desired; and especially in those cases where the speed is changed at the will of the operator, this type of machine has special advantages. Its variable speed together with the rapidity with which it changes its torque, and the very great effort it can put forth in starting, renders this type of motor very valuable for railway work; also for elevators, cranes, etc. On account of the great starting torque, they can get the load under way in the least possible time; and if it is desired to increase or decrease the speed, it can be done almost instantly. The rapidity with which the series motor can change its torque and the amount of starting effort it can put forth are not so great as with the shunt or differential windings, but it possesses the advantage that the speed can be varied at will and this makes it desirable for a line of work for which the shunt and differential motors are not adapted. For driving most machinery for which a constant speed is desired, the differential and shunt windings have been devised.

NOTES FROM MEXICO.

Silan, Mexico, May 19, 1897.

Editor "Electrical Worker:"

For want of travel since my last letter, written from Aguas, I am not in a position to give much electrical news, but I derived some information upon the silver question during my stay at Aguas, which I know will interest Bro. McFarlane of No. 9, at least, who, like myself, was told previous to the last general election in the States that in the event of the success of the Democratic party, the United States would be flooded with free silver from Mexico. During my stay in Aguas I visited the vast smelters, the largest in the world, owned and operated by Guggenheim & Sons of New York City, where I derived a great deal of information, apparently not in the possession of Mark Hanna. But before I go into the discussion of the silver business I want to say a few words so as to enable your readers to comprehend the vastness of the Aguas smelters. This plant covers one hundred and twenty acres of land, besides the ground covered by its railway tracks, where ore is received from many parts of the Republic. These yards cover about seventy acres more. The plant consists

of twenty large buildings, as follows: One office, one store, two engine rooms, one boiler room, one building for testing ores, three for retorts, one building containing four silver furnaces, one building containing three copper furnaces, one separating room, one warehouse, four elevators, one for crushing ore, one repair shop, and one sulphur bin, the latter being 20x1100 feet in dimensions. The plant employs upward of 2,000 men, all of whom are peons, receiving, with few exceptions, 37 cents per day (in silver). Over these, as overseers and officers of the company, are forty Americans, whose wages, of course, are higher, whose duties are to look after the work, keep books, weigh the metal, and run and repair the machinery, among which are two T. & H. dynamos and nine motors, ranging from 5 to 30 horse-power. All the machinery in the plant is of American manufacture. The capacity of the plant is 1400 tons of ore per day of 24 hours, and the average daily output is 52,000 lbs., or two car loads. Of this amount 3000 lbs. is copper, 12,000 lbs. is silver, and the balance is lead, with traces of gold, besides the sulphur output, which is considerable. These are the figures as they averaged up during the month of January last, and will give a good idea of the regular output of the plant. These metals are not refined here, the lead and copper only being separated, both of which contain the silver and gold. All the products of this smelter, and another owned by the same company, but somewhat smaller, located at Monterey, Mexico, are shipped direct to the refineries of Guggenheim & Sons, at Fort Amboy, N. J., where it is refined and placed upon the market. This is the information that "Mark" has not got yet, although this metal has been shipped to the States for years.

I have information that the Kansas City Smelting Co., having refineries at Kansas City, and smelters at San Luis Potosi, Mexico, are also large importers of silver, copper and lead, whose product, with that of the smelter of Guggenheim & Sons, constitutes one-third of the metal product of the Mexican Republic. If I am rightly informed, the Kansas City Smelting Co. formerly operated smelters in Colorado, but finding that silver could be produced cheaper in Mexico, with labor at 30 cents per day, than it could in Colorado, with labor at \$3. per day, this company closed their smelters there and opened those at San Luis Potosi. I have also learned, while here, of a new application of the law of supply and demand. The silver bullion is smelted here, refined in New Jersey, and placed upon the market at 47 cents on the dollar. Uncle Sam buys it, puts his eagle and goddess upon it, and the 47 cents are changed to one hundred, and Mark Hanna only knows who gets the 53 cents represented in the law (of supply and demand).

From these statements I wish the boys to learn that the United States are flooded now, and have been for years, with Mexican silver, and that the coinage demands in the States, even under free coinage of silver, cannot increase the importation of silver from Mexico unless they increase the production of silver here.

I am sorry to say that the requirements here for linemen and electricians are limited to foremen. Under the laws of the Republic, all labor must be per-

formed by peons, and the only chance for a foreigner is to supervise work that the peon does not understand, so you will never find an American employed here in the electrical business, unless he has a telegraph division, or has charge of a light station. In the former positions I found Bros. C. S. Arthur of Detroit, stationed at Aguas, and Bro. Thompson in charge of the reconstruction of the Tampico branch of the Mexican Central system. So, if there are any of the boys who are anxious to come to Mexico, I would say to them, get your job first, and under no circumstances come here looking for work, because you may go hungry looking for work that no one but a peon can lawfully do. And there is another thing in this country—no one is paid for what he does; he is paid for what he knows, and his wages depend upon the demand for his knowledge. The peon knows nothing. He knows less than the burro he drives, consequently he draws little pay. He will work, however, in fact, do all the work, and therefore few foreigners are required. F. E. PETERS, of No. 61.

Silan, Mexico, May 1, 1897.

CHICAGO PLUMBERS WIN THEIR STRIKE.

The Journeymen Plumbers of Chicago, after nearly four weeks' hard fighting, won their strike, the Master Plumbers conceding to the demands of the plumbers, and signing their agreement. The strike of the Chicago plumbers was for the enforcement of an apprentice system, and limiting the number of apprentices to one for each shop. The new agreement on this point is as follows:

"A boy must be at least fifteen years of age before he can be employed as an apprentice. The full term of apprenticeship shall be six years—four years an apprentice and two years a junior plumber.

"There is to be allowed for the first year of this agreement one junior to every three journeymen, and for the second year of this agreement one junior to every four journeymen actually employed. In shops where there is but one journeyman employed the employer will be allowed to hire one junior. The journeymen in all cases to be employed before the junior can be.

"Each shop shall employ but one apprentice, and it is expressly understood and agreed that the employer shall have absolute control of the apprentices; and it is further agreed that the apprentice shall be registered with the secretary of both associations."

The hours of labor are to be eight hours per day, with a half holiday on Saturday during the summer months. Journeymen's wages remain the same as under the old agreement—\$3.75 per day, with \$2.25 for the half Saturday. Juniors' wages \$1.25 first year, and \$2 second year.

A LARGE RAILWAY CONTRACT.

The contract for furnishing the motors and for altering the necessary coaches of the South Side Elevated Railroad, of Chicago, Ill., and converting them into motor cars, has been awarded to Mr. F. J. Sprague, of New York City. It is understood that 1,400 cars will be electrically equipped, and that Mr. Sprague's method of motor control will be used.



OFFICIAL JOURNAL OF THE
NATIONAL BROTHERHOOD OF ELECTRICAL
WORKERS.

PUBLISHED MONTHLY.

J. T. KELLY, Publisher and Editor,
904 Olive Street, St. Louis, Mo.

ENTERED AT THE POSTOFFICE AT ST. LOUIS, MO., AS
SECOND-CLASS MATTER.

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St. Louis, Mo., June, 1897.

W. N. GATES, - SPECIAL ADVERTISING AGENT,
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During the months of April and May No. 17, of Detroit, initiated 56 new members; No. 38, of Cleveland, 58 members, and No. 43, of Syracuse, 40 members. This is the kind of work that counts, and what has been done in these cities can be done in other cities if the members set to work with a determination to unionize the town.

Senator Pettigrew of South Dakota has introduced a bill in the United States Senate authorizing the Postmaster General to acquire for the United States the invention of Prof. Crehore and Lieut. Squier, for rapid telegraphing by alternating current, and also to construct a line between Washington and New York for the purpose of experimenting with and perfecting the use of rapid telegraphy.

Acting on the suggestion made in the May "Worker," a number of our Press Secretaries have taken up the discussion of questions that should come before our next convention. From now until the convention meets a large portion of the "Worker" each month should be taken up with such discussions, as all questions that are to be brought before the convention should be thoroughly discussed in advance, so that when the delegates meet they will be prepared to enact laws that will place the Brotherhood in the foremost ranks of labor organizations.

At the recent convention of the International Association of Machinists, held in Kansas City, the gauntlet thrown down by the International Typographical Union at the Colorado Springs convention last fall in regard to linotype machinists was taken up, and it looks as though a great part of the time of the next convention of the A. F. of L. will be taken up with settling the controversy between the two organizations. Nothing pleases the oppressors of labor better than to see a war between two organizations. This has retarded the progress of organized labor more than the combined forces of capital. Go slow, gentlemen.

The Seamen's Union, through its attorneys, Messrs. Jas. G. McGuire and Jackson H. Ralston, has petitioned the United States Supreme Court for a rehearing in the Arago case. The principal ground for asking for a rehearing of the case is that the decision was based principally upon a construction of the thirteenth amendment to the Constitution of the United States, and particularly upon a definition of the term "involuntary servitude," as used in said amendment, although neither the construction of said thirteenth amendment, nor the meaning or definition of the term "involuntary servitude" as used therein, was discussed or argued by the attorneys or counsel for either side in the Supreme Court, or in the court below.

A bill was recently passed by the Legislature of Connecticut imposing a fine not to exceed \$50, or imprisonment for not more than three months, or both, on street car conductors who fail to ring up fare or a ticket as soon as received by him. The corporations in the trust-ridden State of Connecticut, not content, with grinding their employees, and subjecting them to the tender mercies of a Pinkerton spotter, now call on the Legislature to enact stringent laws, even to three month's imprisonment, for neglecting to ring up a fare, while no protection in return is given to the conductor or motorman. We will venture that the street railway employees of Connecticut are poorly organized, or such laws would not be enacted.

The Union fishermen of Astoria, Ore., have organized a Co-operative Salmon Packing Co., and are putting on the market canned salmon bearing the Fishermen's Union label. This label has been indorsed by the American Federation of Labor, and is the first attempt to distinguish the product of fair from unfair salmon packers.

Members of the Union were forced to form a co-operative packing company by the Salmon Packers' Association of the Columbia River, which discharged and blacklisted the active members of the Union, and reduced prices to such a point that it was impossible for the fishermen to make a decent living—even those not blacklisted. The Columbia River Fishermen's Protective Union, No. 6221, A. F. of L., asks all Union men to call for salmon bearing the Union label, and take no other. This will force grocery stores to insist on the wholesale dealers and jobbers to handle Union goods.

Only one new Union to report for the month of May, which appears in our directory of Local Unions as No. 80, but if our readers stop to closely read what fol-

lows "No. 80, Cleveland, O.," they will notice quite a difference in the names of the officers from those in any of the seventy-nine preceding Unions. No. 80 marks an epoch in the history of the electrical workers, as this is the first Union of female electrical workers ever organized. The Union started in with twenty-one charter members, and added fifteen at the next meeting, and is good for several hundred members. Although the Union was started among the employees of the Walker Mfg. Co. (which, by the way, is now Union from the cellar to the attic, or from the common laborer to the highest-priced mechanic), it will soon have in the female employees of all the other electrical concerns in Cleveland.

The decision of the Supreme Court in the Berliner patent case has had the effect of stirring up the independent companies. At a meeting in Chicago last week, a large number of independent companies were represented, and while the main object of the meeting was to form a close defensive alliance in case they should be attacked by the Bell monopoly, yet other questions were discussed, such as forming a national association of the one thousand or over independent telephone exchanges in the United States, and establishing long distance toll lines connecting these various exchanges, particularly between the large commercial centers.

The call for the Chicago meeting was issued by J. E. Keelyn, president of the Western Telephone Construction Co. of Chicago, and about three hundred exchanges were represented at the meeting.

The controversy between the Anchor Mill Co. of Superior, Wis., and their employees, which led to a boycott of the product of the Anchor Mills, has been satisfactorily adjusted, and the Anchor Mill Co. is placed on the fair list of the American Federation of Labor. We congratulate the Nailers and Packers' Union of Superior, and Mr. W. N. Anderson, superintendent of the Anchor Mill Co. on the amicable adjustment of their difficulty, and trust the Anchor Mill Co. will long remain on the fair list of organized labor.

The boycott has also been removed from the H. J. Heinz Pickling Co. of Cincinnati (which company was boycotted by the Glass Blowers' Union), and the Crown Cork and Seal Co. of Baltimore (which was boycotted by the International Association of Machinists). This is a good record for the A. F. of L. for one month, and conclusively proves that the boycott is not "an old and phryed-out weapon" when used judiciously and energetically by organized labor.

Bro. Geo. A. Neal of Philadelphia sends in a clipping from a local paper containing terrible charges against J. W. Simmons, in regard to his relations with his little daughter. The article stated that Mr. Simmons was a member of the N. B. E. W. This is not true, as Mr. Simmons has not been connected with the Brotherhood for nearly a year. The article also mentions the name of H. H. Caldwell as a member of the Brotherhood. Caldwell was expelled by Union No. 26 of Washington, in 1892. We emphatically object to any expelled member of the Brotherhood using the name of the Brotherhood to shield him when the door of the penitentiary is open to receive him.

FROM OUR UNIONS.

ST. LOUIS NOTES.

There is not much to report this month. The promised prosperity has not yet reached St. Louis, and quite a number of our members are still idle.

The different companies are pushing the work on the subways, and probably within the next month the work of drawing in the cables will have commenced. One of the "know-it-alls" was explaining to the usual crowd that congregates at Ninth and Olive streets yesterday that in pulling in the cables it was necessary to first get a rope through the conduit, and this was accomplished by tying a string to a rat's tail and starting him through the conduit. With this string the rope is pulled through, and with the rope the cable. As no one yelled "rats," or attempted to throw the fellow into the ditch, we presume the audience believed the story.

An amendment to the Keyes conduit ordinance has been introduced in the City Council, and is now in the hands of the committee on public improvements. Some weeks ago the Kinloch Telephone Co. asked for a permit to bury wires outside of the conduit district. On examining the ordinance relating to underground conduits, it was found that while it gave the Board of Public Improvements authority to grant permits for burial of wires within the conduit district (Twenty-second street to river, and Wash to Spruce streets), it said nothing about the remainder of the territory within the city limits. Hence the amendment to the ordinance, by which all companies that so desire can place all their wires within the city limits underground.

In the last "Worker" mention was made of the strike on the Holland Building and the victory of No. 1. Three of the non-union electrical workers, after the job was unionized, put their application into No. 1. It requires two weeks for an application to be acted upon, and a working permit was refused pending the disposal of the applications. One of the applicants withdrew his application, and, we understand, left the city. The other two failed to pass examination and were rejected, and their initiation fee (which in No. 1 is \$10), was returned to them. Nothing more was heard from them until last week, when they presented our business agent traveling cards issued to them by a new Union in Iowa. It was not clear on the face of the cards how they did business in this Iowa Union, as it appeared that the men paid \$2, which amount covered their initiation fee and three months' dues. The cards were presented at the meeting of No. 1 last night, and by unanimous vote rejected until No. 1 could correspond with the Union issuing the cards, and get some further light on the subject. When an electrical worker comes from a city where there is a Union and applies to a Union in another city for admission, that Union should not admit the candidate until it finds out why he did not join the Union in the city where he came from. This should be made a part of our fundamental law. It is not necessary at present to mention names or particulars, as the entire transaction is familiar to the two Unions directly interested, further than to state that when these parties came to St. Louis and went to work on

the Holland Building for \$2 a day, Union No. 1 had probably forty or fifty members idle, who would not work below the Union scale, and, further, that these men, by refusing to join our Union, caused the strike which led to a direct loss of probably \$1500 in wages by the mechanics who went out to enforce the working rules of the Building Trades Council.

Grand Treasurer John Hisserich has been sick for the past two weeks, but is now reported convalescent, and he will probably be at work again in a few days.

ELECTRON.

UNION NO. 2, MILWAUKEE, WIS.

On May 24th the inside men went on a strike to enforce an agreement very similar to the one published in the April "Worker." After being out one week, the strike was settled on a compromise, the Union getting nearly every point asked for, which includes eight hours, a recognition of the Union, the employment of none but Union men by contractors, and restriction of apprentices, etc. We did not get exactly what we wanted in wages, but, considering the other points gained, it is a big victory for the Union. We hope other cities will follow the example of No. 1, and secure agreements with the contractors.

G.

UNION NO. 5, PITTSBURG, PA.

I take great pleasure in letting you know that our former Press Secretary, Bro. A. E. Eldridge, was elected President of our Union at the last meeting, and the writer was elected his successor. Mr. T. K. Bevington, our former President, has resigned to take a position in the Duquesne Artistic Iron Co., as solicitor. There being no electric work in his new job, he did not think it worth while staying with us. But I guess he will yet be back with us before long.

I would like to hear from the people on the other end of this State. I mean Nos. 15, 41 and 53. Come, boys, let us hear how you are getting along.

I think Bro. Thos. Wheeler of No. 38 should be given a vote of congratulation on his argument of employed and unemployed in the United States, which was published in the May "Worker." I wish all the electrical workers in the United States were as deep-minded as Bro. Wheeler. We would not have any trouble in getting eight hours a day, and there is no reason why we cannot. All we need is for every man that is in the Union to appoint himself a committee of one to get every electrical worker in his town that does not belong to the N. B. E. W. to join us, and it will not be long until we can make our demands, and get them fulfilled without any trouble.

Work is not picking up much at present, though we expect a good summer. All the big jobs are about done now. I see quite a lot of our members walking the avenue these fine days. I would like to see them come off the avenue and get to the meetings a little more than they do. They will find it more to their interest if they come and help push a good thing along, for I tell you, boys, this Union is a thing that we have been wanting in Pittsburg for a long time, and now that we have got it, you should not leave it to a few men to push along, but come and get your shoulder to the wheel. The more the merrier. We are to have a special meeting on May 27th. I do not know

what is up, but will let you know in my next letter.

Our Union, No. 5, is getting along well. We are taking in new members every meeting. We will not be satisfied until we have every electrical worker in the two cities in our Union. We will get them as sure as you are whoever you are. Everybody in Pittsburg believes in Unions for working people.

The boys are all heart and soul in the Union, and we can see nothing but success before us. We have affiliated with the Trades Union, and expect in a short time to have a scale of wages that will please all concerned. Things are all coming our way, as the City Council passed an ordinance to allow none but Union men to work on any new city buildings. The boys know what that means, and are more than pleased with it. It will make some of those afraid-of-the-boss fellows come in out of the rain if they want to work on any city jobs. This is where we get our laugh. We have several good bills now pending in the State Senate which will be good things for trades unions.

As the song says, "There will come a time some day" when they will all wish they were with us, for in union there is strength. Without a Union, the working class is like fishing without a hook. You have to wait a long time before you can get a bite.

Well, boys, I believe I have said enough for this time, so I will ring off and wait until I see what it looks like in print. If I think well of it you will hear from me in the July "Worker."

Wishing all my brothers prosperity, I will open the circuit.

MARTIN P. FOX, Press Sec'y.

UNION NO. 9, CHICAGO, ILL.

No. 9 failed to have a letter in the May "Worker" for the reason that the majority of our officers, including the Press Secretary, and part of our crew, moved to Detroit. We miss them very much, but as prospect for work in Chicago is like the sun at midnight—invisible here and bright elsewhere.

We could only give them a hearty grip. Wish them luck upon their trip. For 'though they are linemen, they have to live.

After the emigration was over, we had a Vice President, Recording Secretary, and two Trustees left of our official staff. We waited the necessary three meetings, thinking some of them might return, but as none of them reported at roll-call, we proceeded to place in the cushioned seats the best figures we could find for the contract among the Chicago wire-fixer. I was not aware of the fact that No. 9 held a grudge against the members of the N. B., but surely they must, and decided to get even when they elected the writer to the Press Secretaryship's cushion. However that may be, I'll try and keep you all posted regarding work for linemen, and other interesting news.

The Telephone put on a few gangs May 1st, and several of our members are again at work, after being out seven or eight months.

The lighting companies, telegraph and street railways are merely keeping up repairs, and doing only what is necessary to keep the wheels a-rolling. The West Chicago Street Railway is soon to build out to Lyons, and perhaps further. The Chicago and Northern Pacific, changing

from steam to electricity, have three or four gangs at work. The prospects for work are quite poor, and I would not advise those who intend to move to head this way. We hope soon to be able to clear up all open circuits, short grounds, etc., and report all lines and circuits O. K. for all who wish to come, but at present we have nothing to offer.

No. 9 also finds peculiar noises, cross-talk, etc., on her lines, which we endeavor to reduce as much as possible, and while so doing we often think the best devised plan of human mind and heart will be an utter failure unless operated by willing hands. Then let each brother do his duty, not only to himself and his family, but to the Local and the Brotherhood, of which he is a part. If your business is such that you cannot attend the meetings of your local, you surely can spare a moment or two of time to try to persuade those whom you know to be outside of the N. B. to join it. If you cannot be an officer in your lodge, nor give the time necessary thereto, you can once in a while meet with your brethren, and say a kind word to those upon whom the responsibility of conducting the affairs of your Local rests. If you cannot make a speech, sounding in eloquent notes the good of the Union, or discuss practical electrical subjects, you can speak kindly words to your brothers, and always have a good word upon your tongue for your Local and the N. B. at large. It you cannot make yourself a power among men, you can make yourself a power for resisting evil, beating back the venom of slander, and putting to shame the mouth of the evil speaker.

By helping the unfortunate, ministering to the sick, offering cheer to the down-hearted, speaking kind words to the discouraged, always being a manly man, and always putting into all you think and do the fraternal spirit of our Brotherhood—by all of these, or some of them, you can add your mite to the strength and glory of the Brotherhood of which you are a part.

A Correction.—Some time ago it was reported by Bro. Poehlman of No. 2 that a member of No. 9, namely, O. P. Taylor, had been guilty of some crooked work in Green Bay, Wis. I wish to say that the said O. P. Taylor is not a member of No. 9, was not at the time of such report, nor has he been such for many many moons.

Please do not think we are offended at you, Bro. Poehlman, for your mistake; we simply make the correction, desiring to make it known that No. 9 endeavors to keep her doorstep and membership clean.

C. WARREN B.,
Press Sec'y.

UNION NO. 17, DETROIT, MICH.

Work is at a standstill here at the present. The Detroit Telephone Co., the only company doing work at all, laid off their entire force, about 200 men, this week for want of material. About 75 of the men have already left town to seek more verdant pastures, so you see we have still a surplus of linemen on our hands, and while we are sorry to lose those who have already gone, we can rest assured of the fact that every one of them has a paid up due card in his pocket, and they will probably be of some assistance in building up some weaker Unions in other cities. The company reports that they will put back to work their old force gradually as their

material arrives, and expect in about a month to have their full complement of men again at work, which will boom things here for some time, as they have considerable work yet to do.

The Public Lighting Commission intends to install 200 more arc lights during the summer, but as the fiscal year does not commence till July 1st, when the money to do the work is available, and as an economical cyclone has also struck them, and it is necessary to build up a few reputations on the strength of it, their old gang will probably have to do all the work, which will not be much benefit to those linemen who are now out of work. In their paroxysm of economy a few weeks ago, they increased the hours of work of the men engaged in the power house from 48 to 56 hours per week, thereby dispensing with the services of all extra men, compelling their regular force to work seven days per week. It is a noticeable fact that the above rule does not effect any of their organized employees. They also say they intend to increase the work of the employees in other departments as soon as the extra lamps are installed, but as we never cross a bridge till we come to it, when the time comes we will take care of that matter, as we have taken care of all questions that affect our members, and I have no doubt we will handle it in a manner that will demonstrate the truth of the aphorism, "In union there is strength."

The recent decision of the United States Supreme Court in sustaining the validity of the Berliner patents will have a far-reaching effect as far as our organization is concerned. The decision (while it is not a decision, inasmuch as it decides nothing) will create a feeling of uneasiness among some of the independent exchanges that are operating under the Harrison and other patents, and they will probably suspend operations until they can find out where they are at, and lay out some course of action, thereby throwing thousands of our members out of work, but as the independent companies have a combined capital of over \$10,000,000 they will not stand idly by and see their business go to the demultition bow-wows without making a fight that will make it extremely interesting for the Bell monopoly. A few more decisions will cause the American people to stop and consider whether are we drifting? In my opinion it is but one step further towards a monarchical form of government, and while I have no fear for the safety of this Republic, yet it becomes extremely dangerous to place the destiny of a free nation in the hands of a body of men who place themselves above Congress, and whose conscience will not allow them to act upon a case of such great importance to the people as this, on the grounds that they are interested parties, feeling safe from criticism with the knowledge that they are comfortably entrenched in positions for life. The time will soon come when the people of this country will rise in their might and send men to Congress to amend the Constitution and make such offices elective, and thereby enable the people to declare by their votes that a government of the people, for the people, and by the people shall not perish from the earth.

Six months more, and our biennial convention meets in San Antonio. I believe a great many radical changes

should be made in our laws, and especially in our financial system, but I will give my views in some future letter, as I fear I have taken up more than my allotted space this month, and will stop before I trespass further upon the good nature of our editor.

JOE BEDORE.

UNION NO. 22, OMAHA, NEB.

Although I am away from the scene of action I will try once more to fulfill my official duty as Press Secretary of No. 22.

Things in Omaha are pretty quiet just now. Bros. Ashmusen and Longsprey will soon finish at the U. P. shops. I understand that W. R. Bennett intends to rewire his department store and put in a plant of his own in the near future.

Work on the new post office is progressing rapidly, they having nearly all the conduit in and are nearly ready to begin fishing wire.

Grading, etc., on the Trans-Mississippi Exposition grounds is progressing rapidly, and the management expects to start some of the buildings in the next sixty or ninety days.

At our last meeting we had a pretty warm time, and there was some pretty warm feeling manifested between what promised to be two factions, but I think that after the boys have had time to think the matter over carefully they will nearly all be willing to bury the hatchet, and will probably in the end see the wisdom of the action taken by the Union on various matters which came up for discussion. Owing to the character of the matters in question, I feel as though the less that is published of them the better, therefore I must not explain their nature here. The boys should remember at all times that in Union there is strength, but that in disruption there is worse than weakness, for there is generally absolute defeat. Therefore we should try to overlook the shortcomings of our brothers, and remember that the faults which are most visible to us in others are sometimes as visible in ourselves to other eyes.

I was pleased to see the letter from our brother in Old Mexico, as to me it was very interesting, and as it broke in upon the usual monotony of Press Secretaries' letters, I move that the brother repeat his offense as often as he has the inclination or opportunity.

I also hope our sister in Michigan will favor us with a few lines, as it might be the cause of bringing some of us poor mortals to a sense of our situation, and induce us to try and redeem our craft from the low level to which it has fallen in many places.

I am pleased to note the rivalry which exists between some of our Press Secretaries in regards to increase of membership in their respective Locals, and I hope that they will not allow their zeal for more numbers to overthrow their caution as to qualification of applicants for membership. While it is generally conceded that almost any man is better off in the Union than out of it, I have seen cases where I think the Union was better off by leaving some men out.

As I expect to be on the road with the Nebraska Telephone Co. all summer, I think that this will be the last attempt which I shall make as Press Secretary of No. 22, so good-bye, boys, for a time at least.

MARK T. CASTER,
Press Secretary.

UNION NO. 35, BOSTON, MASS.

As Local No. 35 has not been heard from for the last three or four months, I take it for granted that the Press Secretary is dead, or if not, he must have gone to sleep under the shadow of Bunker Hill, but I hope when he awakes that it will not be like the awakening of Rip Van Winkle, to find everything rusted and falling to decay, but will find Local No. 35 slowly but surely working its way to the front.

Although we have not been heard from through the "Electrical Worker," still we are heard from nearly every Monday morning in the local papers, by our workers in the Building Trades Council and Central Labor Union.

I will not write any of the happenings in our Union, as I have heard it whispered that spring in passing laid her gentle hand on our Press Secretary and aroused him to a sense of duty to Local No. 35. Meantime, I am, fraternally,
A WORKER.

UNION NO. 35, BOSTON, MASS.

Local No. 35 of Boston is still on earth. We have been doing some good work in increasing our membership and otherwise.

We have petitioned the Mayor of Boston to select a member of our Local as Commissioner of Wire, and expect that our petition will be granted. We sent it to the Building Trades Council, and had it indorsed unanimously, and then to the Central Labor Union, where some of the political heebers there, under the disguise of labor men, opposed it, but after a hard fight it was approved by that body. The bill was misconstrued by the Boston press, but the Boston "Globe" has published a true copy, which I hereby attach for publication in the "Worker."

"At yesterday's meeting of the Central Labor Union Thomas W. Flood, commissioner of wires of Boston, was charged with the employment of incompetent wiremen, and of discriminating against members of Electrical Workers' Union No. 35. The following memorial was adopted after a long and heated debate: 'To His Honor, Josiah Quincy, Mayor of Boston:

"Whereas, The office of Commissioner of Wires of the city of Boston is a most important branch of the public service, demanding great technical skill and thorough knowledge of the immense interests dependent upon a proper and efficient enforcement of the laws relating to inspection of electrical work and construction; and

"Whereas, We, the members of Electrical Workers' Union, 35, of the Brotherhood of Electrical Workers of America, respectfully protest against the reappointment of Thomas W. Flood as a Commissioner of Wires, believing that he does not come up to the requirements and needs of the position; and we therefore request that his Honor, the Mayor, should, in making his appointment to fill the position, secure a member of said brotherhood, thereby securing the requisite qualifications; therefore, be it

"Resolved, That we, the members of Electrical Workers' Union, 35, request such action on the part of the Mayor as would best agree with the sentiments of this preamble and resolution.

"This protest was indorsed by President Fred J. Kneeland and Secretary Jas. Rehill of the Building Trades Council, and the President and Secretary of

the Central Labor Union were directed to sign the same."

PRESS SEC'Y, LOCAL NO. 35.

UNION NO. 38, CLEVELAND, O.

I think we of No. 38 may be pardoned if we do feel a little large these days, for to us and the city of Cleveland is due a considerable amount of honor, for the one is the organizer and the other the home of the first Local Union of female electrical workers in America, if not in the world. On Saturday last we completed the organization. The Local is composed of twenty-one charter members, has a full set of officers, whose names will appear in the "Worker" in due time. Miss May Patterson is the President and Miss Mainie Stanton is the Recording Secretary. There is not a homely girl in the Local. They all know their business and expect to add new members from time to time, and there is no doubt but they will be able to cope with labor problems in a way that will astonish some of our male friends who have no faith in the new woman, and any man who thinks this organization is going to be a failure is a "mean old thing, so there, now."

Speaking of the girls organizing reminds me of an idea suggested by one of our worthy brothers a few days ago. The idea is a good one, and was something like this: If all the women employed in the shops and factories in the United States would quit work to-day and refuse to ever do another day's work in any shop or factory, the result would be quite startling, for in less than two years three-fourths of them would be married. Now how, you ask, does the brother know this? Why, that is easily figured out. As soon as the girls left the shops and left for good, some one would have to take their places, and as no girl would work, why either men or boys would be employed, and the extra demand would raise the price of labor and the men would demand and obtain higher wages, and this would enable the thousands of men out of employment to not only support themselves, but would enable them to take unto themselves a helpmeet, and I have no doubt thousands would do this, and the result would be happiness, peace, and contentment for those who now toil from early morn till dewy eve, week after week, month after month, and year after year. Now, the brother who is the earnest advocate of the foregoing is not only an earnest and faithful worker in the cause of labor, but he is considered an authority on work shops and girls, especially the latter. He is a bachelor and his postoffice address will be given on application to the undersigned.

Hello, No. 17. I came near forgetting you. By the way, have you any electrical organization over in your town known as the Electrical Sisterhood of Electrical Workers of America? If not, why not? By the way, speaking of No. 17 reminds me that Bro. Bedore doubts my sincerity in offering a box of cigars to any Local that would show a greater gain in point of numbers between Jan. 1st and April 22nd, 1897. Now, Bro. Bedore, I was never more sincere in my life. True, I did stipulate that the winner should come to Cleveland to claim his cigars, but I had to protect myself in some way, as I make the offer in good faith. I expected that some Local and

perhaps a dozen might win and in case they did why I should have to pay, and as I was quite sure that all would not come to Cleveland at once, don't you see, I would be able to pay on the installment plan, as it were. But now that no Local except Detroit has taken me up, I withdraw from all except No. 17, and to Bro. Bedore I turn with that same joy that warriors feel with foemen worthy of their steel. I would like the time to expire April 22nd; Bro. Bedore wants to put it off a month later, June 1st. Well now, Brother, since you want to put off, why not make it even six months, say July 1st? How will that suit? I am willing to concede most anything except the cigars. Those you can't have unless you beat me fair and square. If you do that, you will get the cigars and you won't have to come to Cleveland after them (although we should like to see you here, and have you visit our Local). If I can't get them over to you by boat or rail, why, if I am not too busy, and the walking keeps good, I will bring them myself. How does this suit you, Bro. B.?

Electrical work in Cleveland, outside of a little spurt now and then is very dull, and I see no signs of improvement, but I suppose after election this fall, if Mark Hanna is elected, prosperity will lay around ready to be stepped on.

THOS. WHEELER, Press Secretary.

UNION NO. 43, SYRACUSE, N. Y.

Once more I take pleasure in sending in a few lines to our valuable paper, but I am sorry to say that work here has not improved, some of our best boys in the "profesh" being out.

Work of tearing down the old building at Warren and Railroad streets has begun, and the University block will soon be started, in which will be installed a complete plant, I am told. I hope our boys will be among the employed when the wiring starts.

Things have changed somewhat since writing last time to the "Worker," and now, instead of being a wireman, I am a contractor, as is also Bro. Chadwick, our former president. I say former, as at the last regular meeting, without any action being taken by the Union as a body, he was forced to resign by the action of a few. True, he is a contractor, but there being no contractors' association here, how, rightfully, can such a thing be done? It was said he attended a contractors' meeting simply to act on the by-laws of Local No. 43, not to regulate prices for work, or take part in any action detrimental to the Union, and I ask for myself, and in behalf of a number of the boys, if such action is right or constitutional?

It is said in the Good Book that a house divided against itself must fall, and what we need now is more backbone and less child's play to make No. 43 a success. We have no one that can fill the president's chair better, if as well, as Bro. Chadwick. Bro. McNeil would be the one a number would choose, and I should think it would be far better if Bro. McCarthy and a few other souls could see that by having us in the Union it is given strength. Instead of getting us out and putting us with the contractors, to act as they do, and they do act queer. I would like to hear from others better posted than I, if, where there is no contractors' association, a member is violating his ob-

ligations to the Union by meeting two or three contractors and talking for the Union as regards the scale and hours, and if they don't go a little too far in demanding his resignation without action being taken by the Union as a whole?

As I say, I am now out for myself, and having all I can attend to, I find it almost impossible to get time to attend to my duties as Press Secretary. I shall withdraw from Local No. 43 if it will please a few, but in the event of such action, I shall always have a sincere wish for No. 43's success, and a great respect for the National Brotherhood, for if the boys would only stop to think, they would see that with a large body they can resist the attack of wage cutters and keep up, up, up, until the standard of the electrical worker is reached, and that is when eight hours constitute a day's work, and \$4 a day's pay. Look at New York City, and in '98 it will be still better. The members of No. 43 must be united in thought and action if the Union is to be a success.

B. T. DELAFIELD,
Press Sec'y.

UNION NO. 44, ROCHESTER, N. Y.

There is no news of any importance that I can write about this month except that No. 44 is still in the van and the boys are all feeling fine as silk.

Some changes are to be made in the Bell Telephone Co.'s office in the near future, but just at present I don't know what they are.

Bro. Breeze, who has been out of town for some time, arrived this morning. He says he is going back in a few days again and finish up. He is putting in an isolated plant in Geneva with 54 cells storage reserve, and one in Palmyra of 200—16 c. p. capacity, and also one in Auburn of about 400—16 c. p. capacity. He reports the prospects as being very bright.

It seems to me Bro. Wheeler of No. 38 has been working up his knowledge of arithmetic lately, as he seems to have struck the nail on the head in regard to giving the boys work. There will surely be more men needed to do the work if they only work eight hours instead of ten. The prospects are bright for the eight-hour day in Rochester and the brothers I hope will read in the next issue of the "Worker" that the Flower City Union is working only eight hours a day with ten hours' pay and a new apprentice system to help us keep it that way.

I want to thank the Press Secretary of No. 1 for publishing the agreement between No. 1 and the contractors of St. Louis, as there are some good points in it to which the Locals should take heed, and out of which they might get ideas to settle that troublesome question, the apprentice question.

We are glad to see that No. 22 has at last woke up and spoken her little piece, and I would be glad to see all of the Locals in print, if it was to say nothing more than hello and good-bye, as I think that the publication or organ of any organization is one of the greatest helps to keeping the Union spirit alive in it, and keeps the branches of it more in touch with each other.

I want to tell Bro. Delafield that if Bro. Myers struck out for Rochester, he must have got lost somewhere on the

road, as I have not seen anything of him yet.

Hoping to see every Local in print next issue, I am,
F. GRAHAM,
Press Secretary.

UNION NO. 45, BUFFALO, N. Y.

The best thing for a man in the electrical business to do, if he wishes success, and has not sufficient time to devote to conscientious study, is to join one of our Unions. There he can converse with the different men about his work, possibly gain some new ideas, and surely feel better for having a good sociable time once in a while.

The fact that a person is a fraternity man is enough to assure him a kind reception wherever Union men are located. Bro. Preston and myself will forever fondly cherish the memory of the late Bro. McGinty, because of the magnanimity of his spirit toward all Union men, especially toward us. Though complete strangers at first, we were soon on the most friendly terms through the medium of our Brotherhood.

There isn't much going on among the members of No. 45. Bro. Hopkins had his foot slightly hurt, but is around again, and Bro. Preston and wife are in New York.

The General Electric Co. is putting in ornamental lights on Main street, and the employment given to the few men comes in handy at this opportune time.

Our new local by-laws are out, and all members should be sure to put in claim for one.

The "Workingmen's Political Alliance" is manifesting its existence in Buffalo in a striking manner, and it won't do a thing at the next election.

J. LODGE, Press Sec'y.

UNION NO. 47, WORCESTER, MASS.

Our Union is in fair condition at present. Three new members last week; two week before, and there are five more new members to come in who have paid their fees before the charter closed, but for one reason or another have not been initiated.

Work in Worcester is moving slowly; it keeps along just about so. All the Union boys are at work—or were last meeting.

There is quite a little work to be done in the city, but one job is always done before the next comes. Never mind, they say, better times are coming by and by. I am guilty this time, but will do better hereafter.

V. V. REED,
Press Secretary.

UNION NO. 55, DES MOINES, IA.

No. 55 is still on her pegs, and will continue to be so. We have rented the Trades Assembly Hall, and meet every Saturday night. A committee from the Trades Assembly gave us quite a talk on affiliating with them, but we did not think it advisable at present.

The Mutual Tel. Co. is very busy just now. Bro. Bill Herring has thirteen linemen at work, but I would not advise any of the brothers to come this way, as there are a number of men who cannot get work. The city voted on the 17th of May on a proposition for municipal ownership of electric light plant, and carried it by a large majority.

We added a new light to our circuit last meeting night, and voted on application for another. Our popular brother and Recording Secretary Ed Purcell

has gone into the chicken business. Ed says he will not have to shin poles any more if his incubator works all right.

I would like to see the brothers attend our meetings better. When a brother does not attend it shows a lack of interest in our Union. I do not pretend to say that the brother is not a good Union man, but I would like to see all brothers attend and take part in our meetings. Remember, brothers, in union there is strength.

Bro. Joe Henning paid us a visit on his way to Oshkosh from Kansas City. He said he wished No. 2 many happy days.

JAMES MARTIN, Press Sec'y.

UNION NO. 56, ERIE, PA.

I notice in the last "Worker" and in a great many other papers, also, that many hundreds of men are idle all over the country; men in all walks of life. What is the reason, and who is responsible for so much idleness? Can they be idle and keep out of mischief? A great and knotty problem is before us; how to keep all men employed. I am not a wizard or anything near one; but I will try to point out some of the evils and a possible cure. It could be tried; if it don't help, it can't harm. In the first place woman and child labor has driven many thousands of men out of factories and stores, because Mr. Manufacturer and Mr. Merchant can save sixty to seventy per cent on wages. Is that right? He should at least pay his lady help as much as the male help. She works as many, if not more hours a week. She works for wages which would not pay a man's board and laundry, and the Lord only knows how he would dress. If a law were passed and enforced to compel the merchant and manufacturer to publish every month the name of his help, hours of labor and wages paid, some people would receive a severe shock; the awakening would be painful, indeed. For instance, Mr. Jones, merchant, publishes that Miss A. Smith works five days of ten hours and one day of fifteen hours, for the munificent sum of \$3.50 per week, out of which she surely pays \$2.50 for board and room, carfare and laundry, 75 cents, and must clothe herself on 25 cents a week. Can it be done and keep her off the streets nights? And yet some people think the only happy people are those who toil at the damnation grind from 7 a. m. Monday to 10.30 p. m. Saturday night. Why not employ men? Give them a chance to work. With work they might get married and start a home with the girl who should not be allowed to work in store or factory.

Another cure could be tried with great success; stop prison labor in the manufacture of things that can be made in shop and factory. Take the convict out of prison and make him build good, broad, straight, stone roads from one end of the State to another, from one large city to another. It would not take bread out of anyone's mouth, not a dollar would it detract, even from the farmer. If there ever was a curse to wage earners, it certainly is prison labor, and the only trade they cannot hurt is the linemen and electrical trade.

Now, I am going to howl right out loud; stop emigration, and shut it off short and quick. We cannot find a place for the thousands who flock our shores every day. If they would only go to farming

all would be well, but they hang to the large cities, illiterate, uneducated, and ignorant, and you cannot reason with an ignorant man. All you can elicit from a hog is a grunt. Again, children working in factories are not gaining an education, and they also form an army of ignorant working people. Educate; knowledge is power, and an educated working man you can reason with, but not a dumb-headed foreigner, who cannot read, much less write. Stop this infernal horde of ignorance, and we will not need any \$13 a month murderers to quell a just and advisable strike. Nice pass it has come to, when an American has to be throttled for sticking up for his rights. Stop prison labor, stop child labor, educate, and stop emigration, and the results will stop idleness.

E. T. I.

UNION NO. 61, LOS ANGELES, CAL.

I have again consented to act as Press Secretary for No. 61, as the office was made vacant by the resignation of our esteemed Bro. C. P. Lofthouse. Having previously held the office for one year, I realize its importance, and for that reason I accepted very reluctantly. However, having accepted, I shall endeavor to contribute a short article for each issue, and while they may not prove as interesting or instructive as many others that appear, I shall at least be doing as well as those who do not contribute at all.

Electrically speaking, there is not much of interest to write about. Nothing new of importance not already announced in the "Worker."

Word was received from Bro. F. E. Peters, who is now in Mexico, exhibiting his animatroscope and phonograph. He writes an interesting account of his trip through the South, which I would gladly send you, were it not for the fact that he promises to do so personally.

Walter F. Morgan, repairman for the Sunset Tel. & Tel. Co., at San Diego, has been elected a member of the City Council. Walter was the only Democrat elected on the board, being sent from a strong Republican ward. Walter will continue to shake out crosses as of yore.

In concluding my letter, which is necessarily short for this issue, I have two questions to ask, upon which there is always a diversity of opinion. The questions are: First, In speaking of the belly of a pole, to which side do you refer? Second, In planting an anchor or slug, would you place the cross-piece uppermost or underneath?

In regard to the first question, I am aware that it makes no material difference which side is referred to when speaking of the belly, but as it generally causes and argument when spoken of, let us settle it, if we can. The second question is of more importance, as the best results are to be obtained only from long experience. Now, brothers, if you will kindly answer these questions, giving your reasons therefor, you will greatly oblige

W. A. WOODIS,
Press Secretary.

UNION NO. 65, BUTTE, MONT.

I am glad to see by the May "Worker" that work is picking up a little. It is getting brisker out here, too. Most all the boys have gone to work.

We have changed our night of meeting from Sunday to Wednesday. Some of

the boys had somewhere to go on Sunday, where they had no invite for Wednesday, so, presto change. We added two more lights to our circuit—Bro. A. B. Elliott and C. Potter. Bro. Elliott is working for the Montana Electric Co. He is foreman of the repair shop, and Bro. Potter is working for him. They are both good fellows.

Bro. Winslow has started a construction shop of his own, and seems to be doing very well. He had five or six of the boys working for him last week.

Bro. Ellerick has just returned from a three weeks' out of town. He would not tell us where he had been. Bro. Toole was over at the Hot Springs Sunday, and I did hear some ladies say he had the finest shape in the plunge, only his feet were not mates. I have never seen Bro. Toole with his shoes off.

Bro. Campbell has been sick about two weeks, but I am glad to say he has recovered and is out again.

I read with pleasure Ed De Mers' letter in last month's "Worker," but I did not quite understand what he meant, unless it was the breach of promise suit that one of the fair almond-eyed daughters of Mikado's realm is going to bring against one of our members.

I guess all the old friends of Ed De Mers will be glad to hear of his good fortune. He has captured the superintendentship of the Light, Power and Water Co. at Anaconda. Mike Sullivan is foreman, and Jack Clinton is next, and I am glad to say that they are just the same now as when they worked in the gang. They have not swelled a bit.

GEO. KESSLER AITKEN,
Press Sec'y.

UNION NO. 66, HOUSTON, TEX.

We hope this does not get in too late for next month's "Journal," but news has been so scarce we have nothing to write about. No. 66 cannot boast of a big membership, but what she has is good material—good electrical workers, jolly good fellows, and all-around sports. We are not like some brothers who write that they are learning to ride the wheel, but we have already learned, and hereby challenge any Local in Texas for a road race for anything from one mile to ten, for any three members of one Union in good standing. Brothers George, Caywood and the writer ride '97 model Cleveland wheels, from 77 to 88 gear, and believe that we can leave the dust in the eyes of anyone who wants to tackle us. Our membership is not large enough to furnish material for a base ball nine, as is San Antonio, but if they have any "crack" wheelmen we would like to hear from them.

Bro. Johnson gave us a surprise last week and got married. The writer is assured that he has the best wishes of all the electrical workers for the success and prosperity of himself and bride. We feel certain that he will not do as some of our members have done as soon as they got married—desert the Union.

There is plenty of work in Houston for good men. The telephone company is laying their underground cables and moving into their new building. Mr. Lewis Hall is here superintending the laying of the cable, and is still at heart a true Union man.

As our time is so short we will have to "ring off" for this time, but will have more to say next issue.

J. M. STEVENS.

UNION NO. 67, QUINCY, ILL.

Once more I will turn on the glim, and if my fuse is all right and all lights up to candle power, may say something.

Baseball, balloon ascensions, and band concerts are among the most popular amusements in Quincy just now.

I do know something that everyone else don't, and will tell you. Bro. Walter Dasback left us a week ago for Peoria, Ill. Don't know whether he had a job in view, or whether his best girl is there. But we look for him back soon.

Bro. Jas. Johnson is at St. Mary's Hospital with a bad knee. His brother, Dr. Otis Johnson, and two other medical professors, extracted a piece of bone from his knee. He has been just able to walk for a short time. The doctors say he will be left with a stiff knee the rest of his life. We are very sorry, as Bro. Johnson has a large family, but we will hope for the best for him until further developments. Bro. Ed Dempsey takes Bro. Johnson's place as trimmer for the T. H. Lt. Co. for the time being, if not for a permanent thing. Bro. Johnson, yourself and family have our best wishes.

Oh, yes, boys; I must tell you what I saw while going to the Empire Theater Sunday night. Can you guess? There were, among hundreds of others, two well-dressed young men, and between them was a very neatly attired and handsome young lady, all walking abreast, and close to each other. Of course, we suppose they were going to the theater. Now, what we would like to know is this: Which fellow was taking that lady to the show? Ask Bro. J. H. Nessler; he can tell you the rest.

Bro. L. O. Constantz went fishing the other day and got a bite (from a mosquito). You ought to see Bro. Henry Korten with his red shoes; how they loom up (a pole).

Well, as I have Commercial lights to turn out, and the time has arrived to perform that duty, I will say good night, and finish to-morrow.

I am very sorry to see the boys losing interest in our meetings the way they are. One stays away for one thing and another for another thing. Some get angry because the inside men don't like to have them do inside work, which they should not, as they hold salaried positions. A very small thing to get mad at. We have started a move to have a No. 1 speaker come some night and give us a lecture. A good thing, boys; push it along.

C. H. McNEMEE,
Press Sec'y.

UNION NO. 68, LITTLE ROCK, ARK.

As our Press Secretary seems not to know that he holds the position of Press Secretary, I will try and inform him of the fact through our paper. I am sorry that he has been so unthoughtful about his duty.

Being that we have not had a letter in the "Worker" for some time, I will try and let the boys know that we are still in the ring. We are having quite a lot of work through this country at present. The Postal Telegraph Co. have made quite a show here. They have a very nice office on Second and Main streets. We are glad to welcome them to our city. About the only fault any Union man can find with them is that they don't have many Union men working for them. You ask the men why they don't

belong to the Union, and they will tell you, "Oh, I am a Union man at heart, but never had a chance to attend to a Union." Always away from where the Union is. Now, brother, you know that won't work. Any man who wants to be a Union man can join, whether he will ever be able to attend a meeting or not. The writer has been talking to some of the boys about joining our Union, but they seem to think they ought to have a position where the Union is before joining. Oh, boys, that will never do. Come on and join us, and then take out a card and go your way rejoicing. It is so much better to be in good standing with the Brotherhood, and be recognized when you go to a strange place. Brace up, boys, and come along and be with us in this good cause. Delay don't mean anything good, you know.

Local No. 68 is in very good condition now, both in membership and financially. We have some lively meetings occasionally. We have a few members who do not regard the by-laws as they should. This causes quite a discussion sometimes, for we have some members who insist on doing business according to the constitution and by-laws. In our last meeting we had quite a lively time. Some few remarks were unnecessary, so I hope such a thing will not happen again. It is much better, brothers, to live in harmony than to live in discord with one another. No matter what a brother has done, try to help him along for a little while, anyway. Don't kick him down when he is trying to do better. I do not think that is unionism at all. Let us all pull together, and make this one of the most prosperous years in our line of business since we have been organized into a Brotherhood, although we are handicapped under Mark Hanna's administration. But wake up, boys, and live in hope for the prosperity which will come by and by. That is, if we live long enough to see the Hon. W. J. Bryan of Nebraska elected President of this great country.

The Electric Light Co. is going to have a lively time this summer. The Little Rock Traction and Electric Co. is adding more new machines to its plant, for the purpose of furnishing lights to those who have been robbed for the last two years. The Edison Electric Light and Power Co. has a mighty nice man for superintendent. The head officers are a set of men who want the earth, a fence around it, and a few men to attend to it, all for nothing, and if they can keep a good man out of the Union they think they have won a great victory. We have a few men in our city who have good positions in the electrical business, who can't see what good a Union is for them. Still, they would like to be members, but are afraid of the boss. That is the great trouble with us to-day, brothers; the boss knows, or seems to think, that his employes regard him as some great idol. I do hope for a time to come when the laboring men can demand fair wages for his labor, but I can't see at present how wages will ever be better under a high tariff and gold standard. But I suppose we can live on the promise of prosperity, as we have for the last eight months.

Well, I will not take any more room in the "Worker" this month, as there are others; so, accept my high regards for all the members of the N. B. E. W. of A.

WILL DROGOON.

UNION NO. 69, DALLAS, TEX.

Once more I throw the switch, but this time to roast No. 69's men into line, and to remind them that true Union men never allow such rough treatment as I have to give. But it is a fact, we have some brothers who do not deserve to be called brothers, for their presence in our hall is something of the past. Brothers, are you asleep to the interests of your fellow-man so long as you are faring well, or do you wait until you are in want of some assistance and then come and reap the benefit we have labored and strived for? A man who is not willing to work and assist his fellow-brothers regardless as to who it may benefit the most, is not a true Union man and is a detriment to its cause. I ask the brothers of No. 69 to come to the front and show by your actions and deeds the loyalty you have for the N. B. E. W. of A. While the hard times have been our worst enemy, let our little band rally to the front and keep our colors waving in the breeze and in the end we will come out victorious.

I understand that the Postal Co. is working only three gangs, so the outlook for our boys is not very bright, but good luck to those who were fortunate.

Last Saturday, May 8th, we failed to have a quorum by one man. Now, brothers, don't let this occur again. If you mean business, attend our meetings, work for the Local, bring in an application once in your lifetime, and in a short time you cannot afford to miss a single meeting.

I received to-day a letter from Robert G. Wright, also one of his little books, which I must say is a very interesting book. I dare say Bro. Wright will ever be grateful to those who may assist him by buying his book, the only way he has to support his wife and child and get medical aid, which he must have before he can receive any relief.

CHAS. TROTTER, Press Secretary.

UNION NO. 70, SCHENECTADY, N. Y.

Work in this city is improving. It is reported that the General Electric Co. have a large number of orders, which report, if true, will give us employment for the summer.

In the last issue of the "Worker" we were requested to discuss the plan of a weekly out-of-work benefit. In my judgment this is what we need, as there are very few workmen who can well afford to be idle, and I do not think you will find a brother who has been out of work any very great length of time who will not favor this plan; not only the brother, but his family, will see the benefit that is to be derived from it. Once let our wives know that we are members of an organization that will not only pay a sick and death benefit, but will protect us from that much-dreaded time of idleness, and see if she will favor us getting out of it, and we all know when those dear good wives of ours make up their minds that a thing is right, we must get there, right or wrong. And there are those poor single men who can not, or who have not the courage to ask some good girl to join hands with him in keeping the burtons on; he must have some way in which to raise the money to pay for his daily bread, and to save him from throwing his belongings (two collars and a bunch of cigarettes) out of the third story window, and taking the

railroad ties for parts unknown. In fact, all would be more or less benefited. I should here like to make a proposition: Suppose we pay this benefit upon the same plan as the Cigar Makers' International Union. The longer a member, the greater the benefit. After a member has served one year, the benefit to be \$2 per week; two years, \$3 per week; five years, \$5. I do not think, after a brother had reached the five-year grade he would care to be dropped, to start at the beginning or as a new member. This would, I think, keep us better in line, and our Unions would not have so many cases of unpaid dues. This plan could be arranged the same as our insurance; let the assessment be collected from the Union, and not from the individual members. A certain amount could be laid aside by the Local Unions, and when this has fallen below a stated amount, a call would then be made upon the members. The same with the National body. They will have a stated figure, say, \$1,000. When it falls below this amount, they will call upon the Local Unions. In this way we would have a large benefit for very little money.

Our brother from No. 38 desires to know why the girls in the electrical factories are not more thoroughly organized. I think the real cause in our city is that they are expecting to get married every day, and do not think it worth their while to become members of an organization; and still, every day we hear of them passing away as old maids, always looking for the husband that is not so foolish as he looked. But I think if this out-of-work benefit can be arranged so as to take them in for a reasonable amount, you will see those dear ones hover around us like flies to a limburger cheese. We have in Schenectady, N. Y., about 500 girls who work at the electrical business. They would make a fine Union of electrical workers. Don't you think so, Bro. Press Secretary of No. 38? I hope you will be a delegate at the next convention and will push this matter to a finish.

WM. A. BIRCH,
Acting Press Secretary.

UNION NO. 72, WACO, TEX

There is not much work going on in Waco at present, but all the boys of No. 72 are working. We have all been rushed for the last two weeks on account of the May Carnival, and it was a grand success. No. 72 made a grand display. We were out in full force and made a big hit. We decorated a summer car with 410 lights, red, white and blue, and our banner, "National Brotherhood of Electrical Workers, Local Union No. 72, Waco," in big letters. Thanks to the supply companies of Waco for helping us out in letting us have lamps, sockets, wire, and, in fact, anything we wanted, and also to the Citizens' Railway Co. for the use of the car without one cent of cost to No. 72. Mr. B. B. Reigen, Supt. and T. A. Stuart, Secretary, lent us a helping hand in making our display a success, and the boys of No. 72 worked eighteen hours a day for one week, but the boys are in it to stay, and don't mind a little thing like that.

Unionism in Waco is progressing nicely. There is quite a lot of interest taken in that direction lately. We have a Trades Union that meets second Sunday in each month, composed of delegates from Carpenters, Typographical, Knights of Labor, Painters, and others, and we

have a red-hot meeting all the time. We are getting in the push and we want to keep pushing and with such men as Mr. Sam Flores and Jos Hodges at the wheel, she will keep rolling. Let the good work go on.

We will do considerable work in Waco this summer. We have two more victims to attach to our circuit and receive the mysteries of the order. Come in, boys; it's a good thing, push it along.

G. R. LOCKHART, Press Secretary.

UNION NO. 75, GRAND RAPIDS, MICH.

Once again I am expected to inform our absent brothers that No. 75 is still prospering.

After being president of No. 75 for the past term, I was willing and glad to give the chair to a younger man than I, and sometimes think young men make better officers than the older ones. Too much praise cannot be given the retiring officers for the harmonious way they conducted the business of the Local during the past term. At our last meeting we elected the following officers for the coming term: Wm. Orr, president; I. D. Hicks, vice president; F. Gunnell, recording secretary; "Old Wheel Hoss" George Higgins, financial secretary; D. B. McIntyre, press secretary; Frank Cole, Ins.; C. W. Blain, For.; C. Fortier, trustee. I hope the incoming officers will be at their post of duty each and every meeting night, and I further hope that some of the members will try and attend meetings a little more regularly, especially those who stand on the street corners and criticise those who do attend and try to do the best they can for the good of the Union. But, boys, come yourselves, and remember your vote counts one, and if you attend, we could probably arrange matters more satisfactory to all. I can well remember when a young lineman, a member of our Union, and now employed by the Bell Telephone Co., wanted the single man's sick benefit raised from \$4 to \$5 per week. He came to the Union, and in one meeting night he came out victorious. So, boys, come yourselves, and if there is any grievance state it in the Union, and not make street talk of it.

We have a Union here in Grand Rapids that we should all be proud of, and I venture to say that we have as snug a sum in our treasury as any Union of its size in existence. It may seem a trifling matter to neglect the Union while we are in good health, but we do not know the hour that we may be disabled, and \$5 a week will keep the wolf from the door, and to know that we will have a decent burial is something, as the most of us are not overly flush. We can all recall to our memory when a few members of No. 75 were sick and hurt, and how cheerfully and eagerly the brothers were at their bedside to learn their wants. That's right, boys. Always remember a sick and needy brother, and do not let little trifling things interfere in such cases, but try always to live up to what our obligation teaches us.

As far as I know, all members of No. 75 are working. Some of them are scattered in various parts of the country, and we occasionally hear of one as far away as Texas and Mexico, but all seem loyal to their "first love." Everything in our city is about the same as of yore. Very little work is being done, with the exception of the street railroad putting in

600 incandescent lights, to be put in at Reed's Lake summer resort.

The Bell has done considerable rebuilding here, but are through now, and the gangs are all out on State lines.

The Citizen's Telephone Co. are at present building exchanges in the following towns: Ashton, Cadillac, Edgerton, Evart, Harris, Reed City, Tustin. The work is being done under the superintendency of Bro. Alex. McClellan.

Our new municipal lighting plant is at present at a standstill.

Well, brothers, how has prosperity struck through the country? It is pretty chilly here in Grand Rapids.

D. B. M., Press Sec'y.

UNION NO. 78, SAGINAW, MICH.

Union No. 78 has lived successfully another month in its history, and though we have no particular excitement to keep up our interest, we do not fear that the filaments in all our lamps are going to become unfit for current, even if some of those in our middle cluster have gone out.

Richard Jones of this city, who has been working for the 'Phone Co. in Detroit for some time past, has returned with a story that he was discharged for non-Unionism. Jones, who claims to have always been in sympathy with Union labor, says that the foreman did not even give him a chance to say whether or not he was willing to go into No. 17. He says that the reason he has not joined No. 75 is he always "blowed his coin" as fast as it came. Let us hear from No. 17 on this score.

Our janitor is still with us, so the best that can be said this time is "sufficient unto the day is the evil thereof."

GEO. S. CRABBE, Press Secretary.

HATT ON TEXAS AND MANAGERS.

Paradise, Tex., May 30, '97.

Editor Electrical Worker:

This is a place only in name, built by the Rock Island and Texas Town Co., on the Rock Island road's extension through the Territory. The Southwestern Tel. Co. is building a class B line from Fort Worth to Wichita Falls, via Rock Island and Denver R. R. W. J. Francis of Zanesville, O., the foreman, was sent here by the president of the company at Cleveland, O. Twenty-one gangs are out in the field for this company alone, and five gangs are coming down the Iron Mountain R. R. in Arkansas for the Postal Tel. Co. I left the Postal and went to the new boom town of Port Arthur, near Sabine Pass, and found it a dry, tortuous harbor, good to catch landlubbers, but nothing else. Sabine is the real harbor of them all, and will be a shipping port of large dimensions in the near future.

Big Mike Collins is at Dallas slaying for Thos. Lavelle. Mike says Birdsell is at Pueblo, Old Mexico, at \$125 a month, putting in a light plant. He was down to the city last winter, but came back. His brother is a road master at Texarkana on the Split Log R. R.

I have not met many of the brothers in Texas, but may at some future date. This State has an elegant sufficiency in area for one place at a time. To go from the Red River to the Gulf is like going from Baltimore to Boston. From Texarkana to El Paso is like from Omaha to Ogden. Distance! The long distance telephone isn't in it with Texas. We have two extremes in climate. The

North Dakota Arctic wave meets the hot wind from Mexico, and the North and South congratulate each other daily on climatic conditions. Eighty degrees change in temperature in twenty-four hours is the medium of exchange. It is prolific of gray-headedness, lack of ice and presence of rain; water kept in open tanks instead of cisterns. It does not raise oranges, for the trees die, and apples do not grow on account of heat. Too changeable for tropical fruits, too hot for north-temperate zone material. She is a "guess" to know her real mission—a land of peculiarities.

I notice by the news articles in the press the death of three notable telegraph superintendents. L. C. Baker of St. Louis, Mo.; H. E. Jennison of Omaha, Neb., and M. C. Bristol of Chicago, Ill. Three notables taken away in almost simultaneous rotation, like the death of Sol Palmer of St. Louis, W. W. Smith of Kansas City, J. P. Lovell of Nevada, in a rotation of like dimensions. It looks like an electric shock had struck the vital cords of nature at one and the same time. The memory of these men cannot be told in a volume, for they in a way helped to wheel the dirt to make this nation great. Their names should be kept in memory for the good they have done, and we should forget the evil. One man in 65,000,000 is the space they occupied in life as individuals. Did they fill it out, or, in other words, was Cleveland as good a President as Washington or Jefferson? No. You have it in a nutshell. Crack it if you like. Can we supersede them by other men of as good, or near as good, texture and efficiency?

The personnel of some of the living is: B. F. Johnson of the Southwestern Tel. Co., was born at the home of Big Foot, not Mills, but the Indian whom Simon Kenton killed in a hand-to-hand conflict when the frontiers of white settlement were far to the east of the Mississippi River. He is not as good a man, physically, as Simon Kenton was, but he looks after the "Indians" just the same. Del. McReynolds, superintendent of construction of the Postal Tel. Co., "central southwest," was born at Danville, Ill., when Harrington homesteaded the original townsite of Chicago, and is a graduate of a university there. He was sent to Oregon as an expert in rock standard work in '83, like was done in the Royal Gorge in Colorado. He afterwards was assistant to J. H. Baker of Missouri Pacific Southwest system.

HENRY HATT.

An American company has purchased the street railways of Monterey, Mexico, and will equip them with electric power.

The Western Telephone Construction Co. recently closed contracts for installing 300 telephones at Spartansburg, S. C.; 150 at Florence, Ala.; 300 for branch exchange at Fort Wayne, Ind.; 100 at Aledo, Ill., and 200 at Cameron, Mo.

A survey is now being made for an electric road between Houston and Galveston. With the building of this road begins a new era in the matter of transportation in the State of Texas. This will be one of the longest roads of its kind in the United States. New York capitalists are back of the enterprise, and as soon as the preliminary work is finished, the work will be pushed through rapidly.

Directory of Local Unions.

(Secretaries will please furnish the necessary information to make this directory complete. Note that the time and place of meeting, the name of the President, the names and addresses of the Recording and Financial Secretaries are required.)

No. 1, St. Louis, Mo.—Meets every Tuesday at s. e. cor. 21st and Franklin avenue. M. L. Durkin, Pres., 2223 Wash st.; L. H. Daggett, R. S., 1220 St. Ange av.; J. P. Casey, F. S., 2702 Spring av.

No. 2, Milwaukee, Wis.—Meets every Friday at 318 State st. W. A. Geraden, Pres., 457 Broadway; Chas. Herman, R. S., 1805 Walnut st.; Joe Harris, F. S., 448 Russell av.

No. 3, Denver, Col.—E. L. Layne, Pres., 1011 19th st.; Geo. P. Mauning, Sec., 1633 Lawrence st.

No. 4, New Orleans, La.—Meets 1st and 3d Tuesdays at Carondelet and Perdido sts. J. McGregor, Pres., 2111 Rousseau st.; C. M. Hale, R. S., 630 St. Mary st.; R. B. Joyce, F. S., 331 S. Bassin st.

No. 5, Pittsburg, Pa.—A. E. Eldridge, Pres. 156 Devillers st.; H. McGregor, R. S., Nesbit & Allequippa sts.; C. J. Jeffery, F. S., 623 Lowell st.

No. 6, San Francisco, Cal.—Meets 2nd and 4th Wednesdays at Forester's Hall, 20 Eddy st. A. C. Johnson, Pres., 226 Turk st.; J. J. Cameron, R. S., 1510 Mission st.; R. P. Gale, F. S., 1004 Larkin st.

No. 7, Springfield, Mass.—Meets every Wednesday at room 14, Barnes Bldg. Wm. Gregg, Pres., 107 Bancroft st.; T. H. Bowen, R. S., 26 Hubbard av.; M. Farrell, F. S., 59 Broad st.

No. 8, Toledo, O.—Meets every Tuesday at Friendship Hall, cor. Jefferson and Summit sts. P. Crowley, Pres., 848 W. Lafayette st.; E. McGinn, R. S., 235 Western ave.; W. H. Welsh, F. S., 1907 Cherry st.

No. 9, Chicago, Ill.—Meets every Saturday at 106 E. Randolph st. A. F. Snider, Pres., 3433 State st.; L. Christenson, R. S., 1043 S. Irving ave.; C. W. Beach, F. S., 5931 Sangamon st.

No. 10, Indianapolis, Ind.—Meets 1st and 3rd Monday at 29½ W. Pearl st. John Berry, Pres., care of headquarters Fire Dept.; E. Bussele, R. S., 487 N. Illinois st.; E. C. Hartung, F. S., Rooms 5-7 Cyclorama Bldg.

No. 11, Terre Haute, Ind.—Meets 2d and 4th Tuesdays at 8th and Main sts. C. D. Updegraff, Pres., 529 S. Ninth st.; M. Davis, R. S., 918 N. 9th st.; W. H. Schaefer, F. S., 114 N. 14th st.

No. 12, Evansville, Ind.—Meets every Tuesday at cor. 3rd and Sycamore st. Harry Fisher, Pres., 200 Clark st.; A. L. Swanson, R. S., 1054 Water st.; A. N. Grant, F. S., 202 Clark st.

No. 14, Memphis, Tenn.—Chas. E. Blake, Pres., 70 Mulberry st.; J. A. Myles, Sec., 207 De Soto st.

No. 15, Philadelphia, Pa.—Meets every Tuesday at 711 Spring Garden st. E. G. Boyle, Pres., Penn. Farmers' Hotel, 3d and Callowhill sts.; E. Hennessy, R. S., 1518 French st.; Chas. T. Lang, F. S., 829 Race st.

No. 16, Lynn, Mass.—Meets at General Electric Band Room, 9½ South st. Jas. Robson, Pres., 46 W. Neptune st.; C. W. Perkins, R. S., 6 Allen's Court; E. J. Malloy, F. S., 86 Cottage st.

No. 17, Detroit, Mich.—Meets 1st and 3d Thursdays at Room 8 Hilsendegen Block. W. J. Donovan, Pres., 112 Chestnut st.; Geo. H. Brown, R. S., 50 Lewis st.; P. F. Andrich, F. S., 369 Chene st.

No. 18, Kansas City, Mo.—Meets 2d and 4th Fridays at 1117 Walnut st. J. J. Lynch, Pres., 716 Delaware st.; C. F. Drollinger, R. S., 326 Garfield av.; Kansas City, Kas.; J. H. Lynn, F. S., 2215 Woodland ave.

No. 19, Chicago, Ill.—Meets 1st and 3d Tuesdays at 6512 Cottage Grove av. M. J. Sullivan, Pres., 4951 Princeton av.; C. W. Richart, R. S., 5610 S. Halsted st.

No. 21, Wheeling, W. Va.—Meets 1st and 3d Tuesdays at Trades Assembly Hall. H. F. Wyse, Pres., Box 111; C. L. Ullery, R. S., Box 111; W. J. Clark, F. S., McClure House.

No. 22, Omaha, Neb.—Meets every 1st and 3d Wednesdays at Labor Temple, 17th & Douglas st. J. W. Watters, Pres., 2211 Pierce st.; M. J. Curran, R. S., 1814 St. Mary's av.; W. J. Wales, F. S., 1804 Farnum st.

No. 23, St. Paul, Minn.—Meets 2d and 4th Fridays at Labor Hall, 3rd and Wabasha sts. Jno. O'Donnell, Pres., 4th and Wabasha sts.; Thos. O'Toole, R. S., 333 E. 6th st.; F. Volk, F. S., 175 W. 6th st.

No. 24, Minneapolis, Minn.—Meets 1st and 3d Wednesdays at 34 and 36 6th st. S. Geo. Heilig, Pres., 18 9th st.; L. R. Stevens, R. S., 18 Western av.; A. Aune, F. S., 3129 Longfellow av.

No. 25, Duluth, Minn.—Meets 2d and 4th Thursdays at room 6 Banning Bldg. R. Thayer, Pres., 24 Third ave. W.; L. P. Runkle, R. S., 17 Norris Bldg.; Jas. F. Owens, F. S., 414 E. 1st st.

No. 26, Washington, D. C.—Meets every Monday at 628 Louisiana av. Jos. Patterson, Pres., 1127 12th st. N. E.; T. E. Bessman, R. S., 712 13th st. N. W.; R. F. Metzler, F. S., 509 11th st. N. W.

No. 27, Baltimore, Md.—Meets every Monday at Hall, cor. Fayette and Park avs. C. F. Leitz, Pres., 506 S. Pulaski st.; J. P. Jones, R. S., 1414 Mosher st.; F. H. Russell, F. S., 1408 Asquith st.

No. 28, Louisville, Ky.—Meets 1st and 3d Tuesdays at Beck Hall, 1st st. near Jefferson. Calvin Beach, Pres., 1023 W. Market st.; Ed. Herpt, R. S., 607 Magnolia st.; Jno. C. Deibel, F. S., 428 15th st.

No. 29, Atlanta, Ga.—Meets every Sunday at 61½ Alabama st. Geo. Foster, Pres., 100 Walker st.; D. J. Kerr, R. S., 114 Richardson st.; Geo. Raymer, F. S., 121 Rhodes st.

No. 30, Cincinnati, O.—Meets 1st and 3d Mondays at 136 E. Court st. W. Williams, Pres., 26 Mitchell ave., Mt. Auburn; H. C. Genrich, R. S., 305 Broadway; J. F. Harmuth, F. S., 2153 Vernon st., Clifton Heights.

No. 31, Jersey City, N. J.—Meets 3d and 4th Thursdays at 116 Newark av. Thos. Watson, Pres., 513 Jersey av.; F. J. Anderson, R. S., 228 Washington st.; T. L. Jones, F. S., 137 Grand st.

No. 32, Paterson, N. J.—Meets 1st and 3d Mondays at German Union Hall. J. F. Colvin, Pres., 963 Madison av.; Jos. Maher, R. S., 348 Grand st.; Paterson Heights, Paterson, N. J.; John Kane, F. S., 274 Hamilton av.

No. 35, Boston, Mass.—Meets every Wednesday at Well's Memorial Hall, 987 Washington st. J. Larkin, Pres., 13 Cambridge st.; D. McGillivray, R. S., 7 Humboldt Park, Roxbury; R. H. Bradford, F. S., 268 River st., Cambridge.

No. 39, Sacramento, Cal.—J. A. Crombach, Pres., 1613 4th st.; E. G. Fletcher, R. S., 335 J st.; G. E. Flanagan, F. S., 1315 K st.

No. 37, Hartford, Conn.—Meets 1st and 3d Fridays at Central Union Labor Hall, 11 Central Row. M. F. Owens, Pres., 63 Hawthorne st.; D. F. Cronin, R. S., 49 Windsor st.; C. E. Byrne, F. S., 16 John st.

No. 38, Cleveland, O.—Meets every Thursday at 393 Ontario st. R. M. Ross, Pres., 59 Colgate st.; H. C. Ott, R. S., 68 Clara st.; Lawrence Burns, F. S., 222 Cedar av.

No. 39, Providence, R. I.—Meets 1st and 3d Mondays at Phoenix Bldg, 157 Westminster st. H. B. Kelly, Pres., 1950 Westminster st.; M. L. Carder, R. S., 40 Wilson st.; G. D. Higgins, F. S., 8 Carpenter st.

No. 40, St. Joseph, Mo.—Meets every Monday at north-west corner 8th and Locust sts. "Brock-aw's Hall." R. M. Martin, Pres., 1702 N. 3d st.; Wm. Dorset, R. S., 1710 Calhoun st.; F. A. Dunn, F. S., 426 Edmond st.

No. 41, Philadelphia, Pa.—Geo. A. Neal, Pres., 3626 Wharton st.

No. 43, Syracuse, N. Y.—Meets 1st and 3rd Thursdays at Greenwald's Hall, cor. Mulberry and Water st. F. A. Chadwick, Pres., 108 Roberts ave.; G. A. Davenport, R. S., 646 Gifford st.; Geo. W. Porter, F. S., 921 Milton av.

No. 44, Rochester, N. Y.—F. M. Kehoe, Pres., 21 Costar st.; Wm. A. Breese, R. S., 56 4th st.; Fred Fish, F. S., 123 State st.

No. 45, Buffalo, N. Y.—Meets 1st and 3d Saturdays at Council Hall. Wm. Haley, Pres., 125 Erie st.; Chas. Guyton, R. S., 124 Swan av.; C. E. Stinson, F. S., 298 Carolina st.

No. 46, Lowell, Mass.—M. J. Burns, Pres., Police Dept.; Thos. Dalton, R. S., 368 Concord st.; H. E. Maguire, F. S., 95 Christian st.

No. 47, Worcester, Mass.—C. C. Coghlin, Pres., 113 West st.; Geo. R. Lincoln, R. S., Millbury; Thos. Reed, F. S., 61 Myrtle st.

No. 48, Ft. Wayne, Ind.—Meets 1st and 3rd Fridays at cor. of Main and Clinton sts. R. Bartel, Pres., Hotel Tremont; A. J. Lathouse, R. S., 148 Wells st.; G. B. Taylor, F. S., 31 Douglas av.

No. 49, Bloomington, Ill.—Meets 2d Monday at Trades Assembly Hall. C. F. Snyder, Pres., Box 328; Guy Carlton, R. S., East and Market sts.; W. C. Gorey, F. S., 409 S. Madison st.

No. 51, Scranton, Pa.—Jas. Harding, Pres., 601 Meridian st.; P. Campbell, R. S., 1210 Irving av.; Ruben Robins, F. S., 1223 Hampton st.

No. 52, Davenport, Ia.—Meets 1st and 3d Tuesday; A. L. Wheeler, Pres., Atlantic Hotel; J. H. Clark, Sec., 215 Iowa st.

No. 53, Harrisburg, Pa.—C. A. Swager, Pres., 115½ Market st.; Jas. Emuinger, R. S., 25 N. 15th st.; C. Anderson, F. S., 46 Summit st.

No. 54, Peoria, Ill.—Meets 1st and 3rd Wednesdays at 301 Main st. H. Scheerer, Pres., 219 W. Jefferson st.; Harry Dunn, R. S., East Peoria; L. C. Crawley, F. S., 115 Washington st.

No. 55, St. Louis, Mo.—Meets every Saturday at Trades Assembly Hall. L. M. Steadman, Pres., E. T. Purcell, R. S., Gratiot st. S. S.; Wm. Leedon, F. S., 609 Mulberry st.

No. 56, Erie, Pa.—Meets 1st and 3d Wednesdays. Ed. Gilmore, Pres., 218 State st.; E. T. Indermill, R. S., care Black Mfg. Co.; J. P. Hanlon, F. S., 23 N. Park Row.

No. 57, Salt Lake City, Utah.—E. Blair, Sec'y, care of Citizens E. L. Co.

No. 60, San Antonio, Tex.—Meets 1st and 3d Saturdays, Meyers' Hall, Alamo Plaza. Martin Wright, Pres., 114 Roman st.; J. F. Gittinger, R. S., 326 Fest st.; W. F. Hendricks, F. S., 1001 Burnett st.

No. 61, Los Angeles, Cal.—C. F. Lofthouse, Pres., 746 San Julian st.; F. W. Messacar, R. S., Station A; W. K. Kingston, F. S., 119 Kern st.

No. 62, Kalamazoo, Mich.—A. D. Ayres, Pres., 534 S. Burdick st.; L. Bellman, R. S., 540 Pine st.; G. E. Tift, F. S., 324 Sarah st.

No. 63, Tampa, Fla.—Theo. Glinn, Pres., Pt. Tampa City; W. F. Crofts, R. S., lock box 264; Arthur D. Henry, F. S., box 220.

No. 65, Butte, Mont.—Meets 2d and 4th Wednesdays in Good Templars Hall. W. Broadway, J. R. Dutton, Pres., 601 Placer st.; D. J. Winslow, R. S., 103 E. Granito st.; A. G. Ellerick, F. S., Gen'l Delivery.

No. 66, Houston, Tex.—Meets 1st & 3d Mondays. G. O. Wood, Pres., 1214 Providence st.; A. H. Stelle, R. S., 12 Main st.; W. V. Fisk, F. S., care Telephone office.

No. 67, Quincy, Ill.—Meets 2nd and 4th Wednesdays at Trades Assembly Hall, So. 5th st. Wm. Wagner, Pres., 517 Sycamore st.; E. W. Nessler, R. S., 523 Maiden Lane; D. M. Mallinson, F. S., 1120 Vine st.

No. 68, Little Rock, Ark.—G. W. Wilson, Pres., care Brown Machine Co.; C. J. Griffith, R. S., care L. R. Tract. & El. Co.; C. M. Milham, F. S., 309 W. Markham st.

No. 69, Dallas, Tex.—Meets 1st and 3rd Saturday at Labor Hall. S. D. Claiborne, Pres., 141 San Jacinto st.; W. H. Young, R. S., 190 Beaumont st.; F. G. Montgomery, F. S., 190 Collins st.

No. 70, Schenectady, N. Y.—Meets 2d and 4th Tuesdays at Trades Assembly Hall, cor. Centre and State sts. F. Litzendorf, Pres., Crane st., Mt. Pleasant; W. A. Birch, R. S., 603 Liberty st.; J. D. Betting, F. S., 626 Villa road.

No. 71, Galveston, Tex.—Meets 2d and 4th Wednesdays. J. T. Payne, Pres., 1314 Centre st.; F. J. Schallert, R. S., 2514 Church st.; G. L. Garrett, F. S., 2108 Av. L.

No. 72, Waco, Tex.—Meets 2d and 4th Wednesdays at Labor Hall. M. F. Wortham, Pres., 912 S. 6th st.; Jos. Hodges, Sec'y, 728 S. 6th st.

No. 73, Spokane, Wash.—Meets 1st and 3rd Thursdays at Oliver Hall, 336½ Riverside av. Gus Benson, Pres., 504 Nichols Block; T. H. Denter, R. S., box 635; C. C. Van Inwegen, F. S., 107 Howard st. S.

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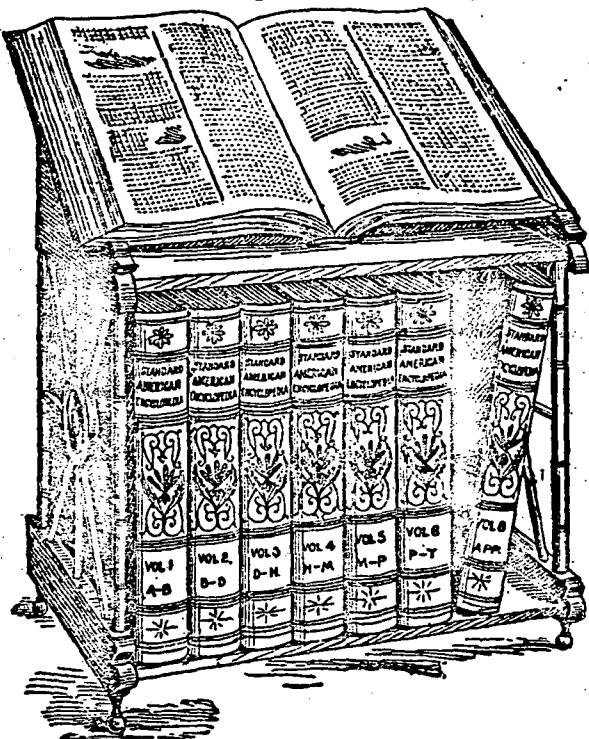
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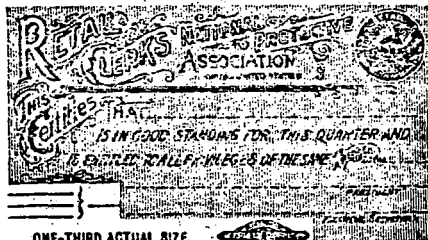
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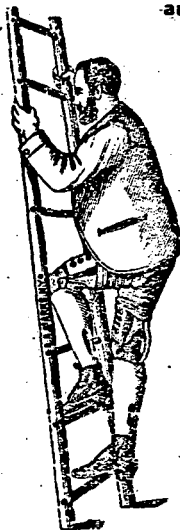
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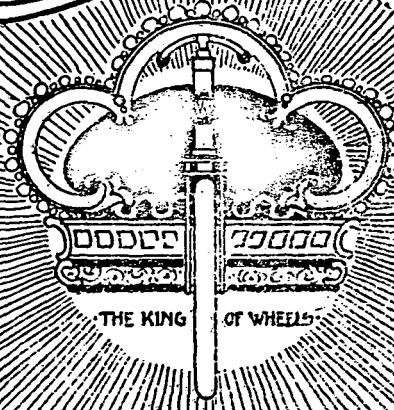
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